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THE COAL INDUSTRY OF
THE EIGHTEENTH CENTURY

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THE COAL INDUSTRY

OF THE

EIGHTEENTH CENTURY

BY

THOMAS SOUTHCLIFFE ASHTON, M.A.

READER IN CURRENCY AND PUBLIC FINANCE IN THE UNIVERSITY OF MANCHESTER

AND

JOSEPH SYKES, M.A., M.Com.

HEAD OF THE DEPARTMENT OF ECONOMICS, UNIVERSITY COLLEGE, EXETER

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PREFACE

THIS study was begun by one of us some five years ago with the object of producing a companion to an earlier work on the Iron and Steel Industry. After a few months of inquiry it became evident that the material was too vast and scattered to be sifted and assembled by a single student. An ally was at hand, and the present volume is the result of close collaboration. Together, or separately, we have searched the chief libraries of London and the provinces; and together, or separately, we have visited all the principal coalfields of England and Wales to examine documents in the muniment rooms of landed proprietors, in the offices of long-established colliery concerns, and in the collections of societies and private individuals. For the Scottish coalfields alone we have drawn solely on printed sources.

We are acutely aware that our pages are too congested with detail for the mind of the reader to pass through them with comfort. Our excuse lies in the scanty treatment which this premier British industry has received from economic historians; it appeared our duty to scatter the facts with a lavish hand rather than to attempt a literary exercise. The reader who is not specially interested in technical processes may lighten his journey by omitting Chapters II. and III.

Our obligations are very numerous. The names of those who have helped in one way or other would fill much space; and we therefore ask the owners or custodians of the manuscripts catalogued at the end of the volume to accept thanks that are no less cordial for want of being more specific. Particular mention, however, must be made of our gratitude to the Earl of Crawford and Balcarres, not only for hospitality at Haigh Hall, but for sending a large box of documents for our use in Manchester; to Sir Francis Newdigate-Newdegate for hospitality at Arbury Hall; to Mr. Edwin C. Barnes for entrusting us with the Barlow and Hasland MSS.; to Colonel W. C. Blackett and Mr. H. C. Embleton for lending us the miners' bonds in their possession; and to Mr. H. R. G. Bayley and Mr. A. FitzHerbert Wright for facilitating our inquiries at Horsehay and Butterly.

The Rev. T. C. Porteus very kindly lent us his extracts from the Halliwell MS., to which we were unable to obtain direct access; and Mr. J. B. Andrew and Mr. Eric C. James guided us to other manuscript sources. For references to particular printed sources we have to thank Professor E. Fiddes and Mr. H. H. Bellot. The whole of Chapter IX. and some paragraphs in other parts of the work are taken from a paper read by one of us before Section F of the British Association in 1927, and afterwards printed in the *Economic Journal* (Economic History Supplement, No. 3). We thank the editors for permission to reprint the paper here.

Generous help was given by Mr. Henry Buckley of Woodford, who transcribed several documents among the State Papers, and by Mr. G. Bridgmore Brown (of the Mines Department), who read through the early chapters in manuscript and made numerous suggestions

on points of mining technique. For the *format* of the book and for help in many matters we are indebted to Mr. H. M. McKechnie of the University Press.

Finally, we must add that our attitude to economic history has been determined by contact with that great teacher George Unwin, and by the traditions he created at Manchester.

T. S. ASHTON
JOSEPH SYKES

February 1929.

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CHAPTER I

INTRODUCTION

Man setteth an end to darkness,
And searcheth out to the furthest bound
The stones of thick darkness and the shadow of death.
JOB xxviii. 3 (R.V.)

I

IN Britain alone of the countries of Western Europe all minerals, with the exception of gold and silver, belong to the owner of the soil. Before 1744 it had been so in France, but exploitation by numerous landowners had led to waste of resources, inefficiency, and endless litigation; and since the small proprietors had neither the knowledge nor the capital adequately to develop the mineral wealth of their lands, the growing need of fuel led to a decree restricting mining to those obtaining concessions from the Crown. Though wealthier than the peasant cultivators, these concessionaires did not usually control sufficient capital to work the mines unaided, and hence the typical form of mining enterprise in France—as in most other countries of Western Europe where like causes were operative—was the joint-stock company.¹

In Britain large-scale ownership of the land made any such measures unnecessary. The judicial decision of 1568 on which the landlord's right to the minerals is said to depend² resulted in an organisation of coal-mining analogous to that of agriculture, and led British landed proprietors to take a close personal interest in the exploitation of the minerals underlying their estates.

¹ M. Rouff, *Les Mines de Charbon en France au XVIII^e Siècle*, ch. i.; H. Sée, *Les Origines du Capitalisme Moderne*, 147.

² *Royal Commission on Mining Royalties, Final Report* (1893), 3.

At almost any point in the period covered by this volume it would be possible to find among colliery entrepreneurs a Duke of Argyle, a Duke of Hamilton, and an Earl of Mar in Scotland; a Duke of Norfolk in South Yorkshire; a Duke of Devonshire in Derbyshire; a Viscount Dudley in Staffordshire; an Earl Gower in Shropshire; a Lord Middleton in Nottinghamshire; a Newdigate in Warwickshire; a Mostyn in Flintshire; an Egerton and a Bradshaigh in Lancashire; a Lowther and a Curwen in Cumberland; a Delaval, a Lambton, a Milbanke, a Brandling, and a Liddell in Northumberland and Durham. These names will suffice to indicate the social class from which a great part of the capital and enterprise of the coal industry was drawn. The men who bore them differed among themselves in many respects: politically they were of unlike minds, and for every prominent Whig in the industry it would not be difficult to find an equally prominent Tory. On the hustings a Lambton might fight a Tempest,¹ a Lowther oppose a Curwen;² but if their common interests were endangered they could act with a vigour and unanimity the effectiveness of which is attested by the highest of authorities.³ This concentration of economic and political power is responsible for much in the history of the getting and selling of coal: it accounts in part for the freedom of the coal-owners from state control; it helps to explain the growth of combinations for the fixing of prices; and it is not without its bearing on the relations between employers and employed.

If most of the proprietors worked their minerals

¹ As at Durham in 1747.

² As at Whitehaven in 1765.

³ When, in 1784, Pitt proposed to solve his financial difficulties by imposing taxes on a number of commodities including coal, George III. wrote on July 1: "It seemed to be an opinion yesterday that the brick tax was the one most likely to be opposed, but Mr. Pitt not having mentioned it, I suppose that branch of trade has not so many friends in the House as the coal-pits, which are the property of more considerable persons, and therefore more clamorous, though not less able to support a new charge on their profits" (Stanhope's *Life of Pitt*, xiii.).

directly or through salaried agents, some found it more profitable to let out a part of them to capitalist entrepreneurs, just as they let out part of the surface to capitalist farmers. These lessees themselves, however, were very commonly drawn from the landed classes: eighteenth-century maps of Northumberland and Durham exhibit little but mining villages and the country seats of colliery gentry; and the appellations most frequently attached to the names of tenants in colliery leases are "esquire" and "gentleman". In other coal-fields humble yeomen and leasehold farmers who required coal for lime-burning sometimes sank pits which supplied the domestic and industrial needs, not only of themselves, but also of their neighbours. Of this class John Barnes of Barlow in Derbyshire may serve as a type. The son of a tenant farmer, and himself, after 1756, the freeholder of some seventy acres at Ashgate, he obtained, in 1763, of the trustees of the Earl of Oxford, the lease of a small colliery in the parish of Staveley, and so set up an association with the coal industry which five generations of his descendants have continued to the present day.¹ The accounts of Hasland Colliery in the same county abound with items relating to husbandry—but the association of agriculture with mining in areas where little capital was required to reach the coal is too obvious to require further illustration.

In Durham the Church was a landowner on a large scale, and substantial revenues flowed not only to the episcopal coffers, but also to the pockets of individual incumbents who worked their glebes for coal or became partners with enterprising capitalists in the mines of their parishes. Elsewhere the connection was less close, but Yorkshire at least affords evidence that the clergy played some part in the development of the industry:

¹ *Barlow MSS.* Grassmoor Colliery, which has now an annual output of 700,000 or 800,000 tons, is managed by the three great-great-grandsons and one great-great-great-grandson of John Barnes.

in Restoration times a curate of Beeston, near Leeds, "a man of rough manners, great resolution and much personal strength", forsook the cure of souls to become the manager of a coal-mine;¹ and a hundred years later Joseph Dawson, an Independent minister, who was in the habit of paying wages to his colliers on Sunday morning before he entered the pulpit, became the chief partner in one of the largest coal and iron concerns of the West Riding.²

As pits grew deeper, it was necessary for capitalists to join forces, and partnerships became increasingly common, especially in Northumberland and Durham. As early as 1726 a copartnership known as the "Grand Allies" was formed by Colonel Liddell, the Hon. Charles Montague, and George Bowes, Esq., to buy up or lease large areas of coal; and by the end of the century there were several small private companies in this area. But although shares in these were sometimes offered for sale by public advertisement,³ most of them were family concerns, and there is nothing in coal-mining to parallel the great companies that controlled the metal-mining (particularly the copper-mining) industry of the period.⁴

Occasionally men of small resources combined to supply themselves with coal, as when, in 1692, twenty-two freeholders of Bolton, a township of Bradford in the West Riding, agreed to share equally in the cost of working a seam.⁵ A striking example of a somewhat different type is afforded by Sheffield, where, in 1793, a colliery was opened, in opposition to that of the Duke of Norfolk, by a number of sick-benefit clubs—

¹ Allen, *History of Yorkshire*, iv. 56.

² Meade, *Coal and Iron Trades*. During the period 1790–1812 a small coal-mine at Llangynwyd in the Maesteg Valley of Glamorgan was worked by a clergyman, Rev. John Parry (T. C. Evans, *History of Llangynwyd*, 26).

³ Notices such as the following are not uncommon: "To be sold by private contract. One undivided Twelfth Part or Share of Washington Colliery". Newspaper Cutting in *Bell Coll.* vol. xx. 331, May 2, 1807).

⁴ H. Hamilton, *The Brass and Copper Industries*, *passim*.

⁵ Cudworth, *History of Bolton and Bowling*, 25.

not, it was said, without loss to themselves as well as to the Duke.¹ In the same year consumers in Birmingham—following the example of the Brass Company of 1781 and the Mining and Copper Company of 1790²—united to work and market coal under the name of the Birmingham Coal Company. According to the articles of the copartnership, a share capital not exceeding £50,000 was to be divided into 1000 equal shares, of which not more than ten were to be held by any one partner. Each partner undertook to purchase annually such a quantity of coal for every share as the Committee should decide, with a maximum of 15 tons a share. Five per cent interest was to be paid on capital, and any profits were to be distributed in the form of an annual dividend. Since meetings for the alteration of the rules were held as late as 1827 and 1836, it would appear that some measure of success was achieved by this early experiment in co-operation.³

In the Midlands, in Lancashire and Yorkshire, in South Wales, and in Scotland the growth of manufactures had important repercussions on coal-mining. By the early seventeenth century coal had come to take the place of charcoal in brewing and distilling; in the making of bricks, tiles, and pottery; in the boiling of salt, sugar, and soap; in the manufacture of glass, nails, hardware, and cutlery; as well as in the smelting and the casting of brass.⁴ From several of these processes overflows of capital passed to the industry that supplied the fuel. In Scotland salt-pans and coal-mines were normally under the same control; and it is not surprising to find a Lancashire bricklayer working coal-pits at Farnworth as early as 1647, and a South Wales copper-smelter, Sir Humphry Mackworth, carrying on large-

¹ *Norfolk MSS. Report of the Inventions of John Curr. Infra*, 66.

² H. Hamilton, *op. cit.* 219-21, 232.

³ *Articles of the Birmingham Coal Col*, 1793. Birmingham Municipal Reference Library.

⁴ See Dud Dudley's *Mettallum Martis* and *J.H.C.* xxiii. 263, cited Mantoux, *Industrial Revolution*, 290.

scale colliery operations before the beginning of the eighteenth century.¹

By far the largest stream of capital, however, was derived from the ironmasters. After the discovery of the process of smelting iron with coke in 1708 or 1709, industrial families like the Darbys, the Wilkinsons, and the Guests, men like John Roebuck of Carron, Anthony Bacon of Whitehaven and Merthyr Tydfil, Samuel Walker of Rotherham, and Thomas Newton and Robert Chambers of Sheffield brought to the development of the coal industry contributions hardly less important, if less spectacular, than those they made to the growth of iron-smelting. After the discovery of Cort's process of puddling and rolling in 1784, integrated coal and iron concerns sprang up on all the more important coalfields of Scotland, of Wales, and of England south of the Tees.² The access of new capital from this source was one of the outstanding events in the history of the coal industry, but its effects were only beginning to appear on a large scale at the end of our period: the interpenetration of the coal and iron-and-steel industries belongs to the industrial history of the nineteenth, rather than to that of the eighteenth century.

II

Any description of coal-mining two hundred years ago must take account of the wide variations in the scale of collieries and their constituent pits. In the technically less highly developed areas the mines usually followed the line of outcrop of the coal measures; and, though many workings might be made in the land of a single proprietor, and so might be regarded as forming one colliery, the individual pit was but a small affair affording work, sometimes for one, sometimes for two, and rarely for more than a dozen colliers.

¹ H. V. Hart-Davis, *History of Wardley Hall*, 231; Phillips, *History of the Vale of Neath*, 234.

² T. S. Ashton, *Iron and Steel in the Industrial Revolution*, chaps. iii. iv.

The smallest undertakings of all were those of the West Country: in 1684 there were more than 70 pits in the chase of Kingswood, near Bristol, but a list of inhabitants shows only 123 colliery workers, including those engaged in carrying the coal. Evidently the normal pit was worked by a single collier, and the very names—*Made for Ever, Strip and at It, Starveall*, and so on—suggest a close personal interest on the part of the working collier.¹

Near by in the Forest of Dean there was a similar small unit of production. Here the "free miners" (men born within the Hundred of St. Briavel's and qualified by apprenticeship, or by having worked a year and a day at the pit) were each given a piece of land by the gaveller in return for the promise of customary dues to the Crown. In early times the limits of a pit were set by the distance to which a miner could throw a shovelful of earth from the shaft; and, though later pits were more extensive, they could usually be managed by four working colliers. The typical undertaking probably consisted of one pit; and a decree of the Mine Court in 1741 prohibited any miner from working more than two at the same time. Later in the century, no doubt, the size of the workings was greater, for there was a tendency for the miners to admit well-to-do gentry to their ranks, especially after the discontinuance of the Mine Law Court in 1777. Nevertheless the output and profits were quite small: according to the gaveller's report, in 1778 the 90 pits at work produced an average of not more than 20 tons of coal a week each, and of the 662 free miners many were so poor that they were unable to pay their yearly compositions to the Crown.²

The Forest of Dean, it may be urged, was exceptional, for capitalism in the modern sense had hardly yet appeared there. But though it is true that large

¹ G. Eayrs, *John Wesley and Kingswood*, 41.

² R. J. Kerr, *The Customs of the Forest of Dean*, *Trans. Bristol and Glouc. Arch. Soc.* xliii. 72; H. G. Nicholls, *Forest of Dean*, 45, 70, 237; *V.C.H. Gloucester*, 227-31.

collieries, employing a hundred or more men, were to be found on the estates of lords and gentry of the Midland Counties and of Lancashire and Yorkshire, the individual pits of these collieries were, according to modern standards, still extremely small. Some of the shafts were barely a dozen yards in depth, and rarely were pits sunk to more than sixty or seventy yards during the first half of the century.¹ The number employed underground is, however, a better criterion of productive capacity. At Sir Richard Newdigate's colliery at Griff (in Warwickshire), which in 1701 consisted of six pits, the men and boys in a pit varied from fourteen at the largest to eight at the smallest.² In Lancashire, at Sir Roger Bradshaigh's cannell work at Haigh, of the five pits open in 1747 four employed six hewers each, and the remaining one five; in the seventeen-fifties the normal pit here had six hewers; in the 'seventies it had six or seven; and in the 'eighties eight or nine.³ Small as are these numbers, they exceed those for other parts of the same county: in Rossendale, as late as 1820, of five pits near Greave, one employed five, one four, one three, and two only two miners each.⁴

In Yorkshire at Shibden Hall, near Halifax, half-a-dozen getters and the same number of hurriers was the complement of a pit in the early years of the eighteenth century.⁵ In Derbyshire the Wharf Pit of the Butterly Coal and Iron Co. had eight getters in 1795; five years later another pit in Codnor Park was worked by six getters;⁶ and as late as 1815 the crew at Nor-

¹ In the Wigan district in 1728 some of the shafts were not more than 12 yards deep, and though by 1740 a depth of 57 yards was reached, many pits were much shallower (T. C. Porteus in *Wigan Observer*, September 28, 1919; Porteus, *History of Standish*, 33). The smallness of the mines in Shropshire is suggested by the fact that in 1730 two master colliers were indicted for sinking pits in the high-road (*V.C.H. Shropshire*, i. 461). In 1732 a pit sunk by the Coalbrookdale Company cost only £2:17s. to open, and five others were untimbered and filled up at a cost of £1:13:7. In the following year another, 29 yards deep, cost £8 to sink (*Coalbrookdale Cash Bk.*, 1732-48). The pits of John Barnes of Barlow in Derbyshire, during the 'sixties were 48 yards deep (*Barlow MSS.*).

² *Coal Pit Book of ye Great Rider* (1701), *Griff MSS.*

³ *Haigh MSS.*

⁴ Tupling: *History of Rossendale*, 226n.

⁵ Galloway, *Annals of Coal Mining*, 320.

⁶ *Butterly MSS.*

briggs Pit, near Killamarsh, consisted of seven getters, four trammers and loaders, and one hanger-on.¹ In South Wales the size of the typical business was probably smaller still. A pit at Llangynwyd in the Maesteg Valley, in 1790, employed but a single collier and a windsman; and even in what is now one of the main centres of large enterprise, the Rhondda Valley, the normal pit was but a small drift-hole worked by half-a-dozen men at the most.²

Northumberland, Durham, and Cumberland, on the other hand, exhibit a much greater scale of operations. Here coal-mining was the main business of the landed proprietor and not merely one of many preoccupations. The surface of the country was dotted over with pit-shafts and lined with waggon-ways; extensive levels drained away the water from hundreds of acres of coal; colliery buildings were permanent structures (the offices of the Lowthers at Whitehaven are said to have been designed by Sir Christopher Wren); and piers and staithes projected into river and sea to load the coals into keels, which supplied the specially constructed vessels that carried them to market in London, Dublin, and the ports of Western Europe.

"One coale-merchant imployeth five hundred or a thousand in his works of coale", wrote Grey in his survey of Newcastle in 1649; and however it may have been of his own time, the figures would hardly exaggerate the number for whom work was found by some of the larger proprietors of the following century. That the pits, as well as the collieries, were larger than those farther south is indicated by colliery accounts and by the heavier death-roll when accidents occurred. As early as 1675 a pit at Whitehaven had a crew of 19 underground workers, and, in 1737, 22 men were killed in the Corporal Pit of the same colliery.³ In 1705 over 30 workpeople

¹ Sorby in *Trans. Inst. Min. Engrs.* xlv. 92.

² T. C. Evans, *History of Llangynwyd*, 26.

³ R. M. Moore in *Trans. Inst. Min. Engrs.* vii. 627.

were killed by an explosion in a pit near Gateshead. Three years later 69 were wiped out when a blast occurred at Fatfield, near Chester-le-Street—though here the men were distributed over three pits, evidently with underground connections.¹ And, in 1767, 39 lost their lives in a single pit from the same cause.² On the assumption that the whole of the crew of the pit was destroyed, the labour force must have been of about the same size as at Kiphill, where, in 1769, 157 men and boys were at work underground in the four pits that made up the colliery.³ If in the north during the 'sixties the normal number of workers in a pit was 40, the industrial unit must have been at least six or seven times as great as that of the colliery of Sir Roger Bradshaigh near Wigan at the same period.

About the beginning of the eighteenth century the maximum depth of working in Northumberland and Durham was 400 feet, and the average less than half this distance.⁴ In 1739 a pit at Saltom in Cumberland, which had workings under the sea, went down to 489 feet, but this was clearly exceptional. After the middle of the century the industry on the Tyne and Wear tended to move east to regions where the coal lay at a greater depth from the surface. In 1765 Walker Colliery had reached 600 feet, and in 1794 a shaft at Hebburn was 774 feet deep. By the opening of the nineteenth century, however, Cumberland again led, for the sinkers at Howgill Colliery, Whitehaven, had gone down no less than 993 feet from the surface.⁵

This increase in depth was probably more marked than the increase in area worked, and we must beware of exaggerating the growth of capacity. According to the author of *The Compleat Collier*, pits in the Durham coalfield at the beginning of the eighteenth century might extend for as much as 150 yards north, south,

¹ Galloway, *op. cit.* 232-5.

² *Annual Register* (1767), 79.

³ Bulman and Redmayne, *Colliery Working and Management*, 48.

⁴ Galloway, *op. cit.* 266.

⁵ *Ibid.* 349.

east, and west of the pit bottom, and there is evidence that many pits at a later period were not much bigger: as late as 1773, to take one example, the 17 pits of South Birtley Colliery appear to have worked only about 30 acres each.¹ The reasons for this relatively slow growth in the confines of the pit are not difficult to understand. The chief costs of the industry were not those of sinking shafts, but those of opening up headways, maintaining floors and roofs, providing a supply of fresh air to the working colliers, and transporting coal from the face to the pit bottom. The putters or barrowmen who performed the last of these operations were usually paid piece-rates, which increased rapidly with the distance over which the coal had to be moved; and, for this reason alone, it often paid the proprietor to sink fresh shafts rather than extend the underground ways of existing workings. At Long Benton Colliery, in the seventeen-forties, the length of life of a pit appears to have been little over three years, and almost every year saw the closing of one pit and the opening of another to replace it.²

A subsidiary reason for the relatively small scale of the industrial unit even in the Great Northern Coalfield may be found in the restrictions imposed by proprietors on the rate of exploitation of their minerals. At Tanfield Moor Colliery between 1743 and 1749 the holders were allowed to get only 1000 tens (or 22,000 waggon-loads) a year, and at Plessey Colliery during the same period a restraint was placed on the output of each shaft: "Morrow and Hodgson's pit was Idle yesterday and to-day on Acc^t of being over many Men [wrote John Watson³ on September 25, 1749] . . . they are only allow'd to work 10 Tens a fortnight at the Lark and 20 Tens at Morrow and Hodson's pit". Obviously impediments of this kind would tend to discourage the expansion of the geographical boundaries of the work.

¹ Galloway, *op. cit.* 273.

² Appendix A.

³ *Journal, Watson Coll.*

That a very substantial increase in the scale of working did occur in all coalfields during the last quarter of the century is beyond doubt, but the process was more gradual, and the result less sensational, than in the textile and iron-and-steel trades during the same period. The expansion of manufacturing industry was associated, whether as cause or effect, with more or less sudden changes in technique, which serve as convenient landmarks for the historian. But in extractive industries the process of discovery and improvement is usually a continuous one, and is therefore more difficult to describe with precision. No flash of genius of a Crompton or a Watt could transform coal-mining. Better methods had to be slowly forged from the painful experience of common men, and only gradually did a new idea or a new device spread from pit to pit, or from one coalfield to another. Development came with the growth of markets and the emergence of new uses for coal, rather than with changes in technique, though these new markets and new uses themselves depended upon technical changes in transport—upon the development of roads, canals, and, above all, of railways.

During the period covered by this volume the market for coal experienced no vast expansion. The movement of heavily laden carts along the ill-constructed roads was possible only in dry weather, and mining was thus, to some extent, a seasonal industry. At Haigh, in Lancashire, though most of the colliers worked throughout the winter, and small quantities of coal were sold every week in the vicinity of the pits, the real marketing of the product began (at least during the period 1747–1787) about the last week in May, and ceased at the beginning of October.¹ In the Midlands the bulk of the coal was sold immediately after the lifting of the harvests, when the weather was usually favourable to transport, and carts and labourers could be released from the farms.² Again in the North-

¹ *Haigh MSS.*, *passim*.

² *Infra*, 122.

Eastern Coalfield, from which the bulk of the output was carried to London, sales were intermittent. In the early part of the century the collier fleet was set aside during the winter and shipping was not resumed till April; and though by the late 'thirties it had become the practice to terminate the close season early in February, the trade was still subject to occasional interruption from the freezing of rivers, or from storms in the North Sea.¹ In the same area, at least in the early part of the century, it was customary to close down land-sale collieries (those supplying local markets) during the winter months.² Not until inland waterways and railways had been constructed on a large scale was coal-mining able to expand rapidly; and just as the industry remained relatively small, so also did the units of which it was made up.

Early statistics of production are little better than guesses. But following the less unreliable of many estimates, the output of the United Kingdom for 1660 has been put at two and a quarter million tons, and that for 1700 at two and a half million tons. By 1770 it was perhaps something over six million, and by 1800 over ten million tons.³ A fourfold expansion in a century was no small achievement; but it appears paltry when set beside the twentyfold growth, from a larger initial figure, that occurred during the succeeding hundred years. If the term Industrial Revolution can be aptly applied to any period of coal-mining it must be to that which saw the headlong, almost devastating, expansion of the middle decades of the nineteenth century. In this volume we are concerned only with the antecedents of that revolution.

¹ See, for example, *J.H.C.* xxix. 1047, for effect of the weather on the supply of coal to London in April 1764.

² *The Compleat Collier*, 1708, reprint 1846, 42.

³ *Royal Commission on Coal in the United Kingdom* (1871), vol. iii. 2. See graph in Clapham, *Economic History: Early Railway Age*, 431.

CHAPTER II

METHODS OF WORKING COAL

He putteth forth his hand upon the flinty rock;
He overturneth the mountains by the roots.
He cutteth out channels among the rocks;
And his eye seeth every precious thing.

JOB xxviii. 9-10 (R.V.)

I

THE first stage in the opening of a coal-mine is to make a boring so as to prove the existence of the coal, to ascertain its depth, and to lay bare the obstacles to be overcome in reaching it. The process, as it was carried on in the Great Northern Coalfield in 1708, is described by the author of *The Compleat Collier* as follows:¹

"We have two labourers at a time, at the handle of the bore Rod, and they chop or pounce with their Hands up and down to cut the Stone or Mineral, going round, which of course grinds either of them small, so that finding your Rod to have cut down four or six Inches, they lift up the Rod, either all at once, as there is conveniency for its Lift; or by Joynts fixing the Key which is to keep the Rod from dropping down into the hole . . . and taking off the cutting Chissel, puts or screws on the Whimble or Scoop which takes up the cut Stuff be it what happens. . . ."

Borers were highly specialised, well-paid workers. They usually entered into a contract with the coal-master under which they were paid a certain price for the first five fathoms, a higher price for the next five, and so on as the depth of the boring increased.² When

¹ Reprint, 1846, p. 5. For details of the tools used see Brand, *History of Newcastle* (1787), ii. 678.

² At the end of the eighteenth century in the North-Eastern Coalfield the initial rate of pay was 5s. a fathom. It increased by 5s. a fathom for each

they had completed their task, received their stipulated payment, and spent on ale the gratuity which it was customary to make them, they moved on to another colliery, and their place was taken by the sinkers.

In the North of England a four-sided pit was first cut in the surface soil, but as the sinking proceeded towards the stone it was shaped to an octagon, and the shaft through the stone itself was circular in section. The sides above the stone were lined with deal boards to prevent falls of earth, and when sand was met with it was usual to hold it back by ramming clay between it and the wooden tubbing. When the sinkers came to the wet strata they sometimes packed undressed sheepskins between the boards and the stone, so as to prevent "feeders" of water from emptying themselves into the shaft; and sometimes the sides were lined with bricks, behind which spiral channels, known as *garlands*, were constructed to carry to the pit bottom water which would otherwise have forced its way into the shaft.

When hard rock was encountered it was necessary to call in the aid of explosives. Gunpowder had been used for blasting by German miners in Staffordshire as early as 1638, and had slowly been adopted in lead and copper mines elsewhere. There is no known record of its employment in coal-mining before 1719,¹ but our manuscript sources make it clear that it was extensively used in later years. In November 1728 it was purchased for use at Griff Colliery in Warwickshire;² an entry in John Watson's Journal attests its employment at Lanchester Moor Colliery (Durham) in May 1750;³ and one of the earliest entries in the Barlow accounts records the payment of £1:1 7s. for gunpowder required in sinking a pit 48 yards deep in 1763.

additional 5 fathoms, so that between 6 and 10 fathoms, for example, it was 10s., and between 90 and 100 fathoms, 100s. *Report on the Coal Trade* (1800), 573.

¹ Galloway, *op. cit.* 227.

² *Coal Pit Accounts*, 1722-34.

³ This is over a quarter of a century earlier than the first instance given by Galloway of its use in the north (*Annals*, 285).

Like the borers, the sinkers were usually paid piece-rates, which increased as the pits grew deeper. In 1701, at Griff, for example, they received 2s. 6d. an ell for the first four ells, 3s. for the next four, 3s. 6d. for the next four, and so on.¹ The work was usually undertaken by a number of men for an agreed price; but if exceptional difficulties were met with, such as those presented by hard rock or rushes of water, it was usual to make additional payment; and a gift of money for ale invariably marked the completion of the operation.² At the larger collieries the sinkers were specialists, and the craft, like that of boring, tended to be hereditary. So long as pits were small the period between the end of one sinking and the beginning of another was not great, "for it is judged to be a point of Wisdom and Care, not to be too long or tedious in providing a Pit or Pits, to be ready sunk and ready to set to Work against the time you have Wrought out your Coaled Working Pit".³ The gap could therefore be bridged by the savings—or capacity to borrow—of the sinker, who chose to remain idle rather than undertake the work of cutting or drawing. But at the smaller collieries, like Barlow and Haigh, the sinkers were often obliged to act as hewers when there was no call for their specialised skill.

The next step in the opening of a mine varied according to the method of working to be adopted. In Durham, where bord and pillar working was universal, headways were driven along the grain of the coal, and from these, at intervals, the bords or stalls of the hewers were cut. According to *The Compleat Collier*, at the beginning of the century, the working places were 3 yards in breadth, and between one bord and the next a pillar, 4 yards

¹ *Coalpit Book for ye Great Rider*, 1701.

² "29 Nov., 1749. Spent on Sinkers as usual at the finishing of the Pitt, 10s. 6d." *William Porter's Day Book*, 1744-55, Haigh MSS.

³ *Compleat Collier*, 25. Cf. Sir Richard Newdigate's instruction in *Griff Coalpit Book*, 1701: "Memo: the 6th Pitt to be well secur'd and Scaffolded over and not worckt till the Second Pitt be cut, and that redy to be set upon and the Barrell Gin sett thereon".

across, was left standing, so that less than half the coal was removed from the mine. At this period the pillars were square in section, as they continued to be in Scotland and in Cumberland till modern times. It was found to be easier, however, to cut the coal along the main plane of cleavage; and hence in Northumberland and Durham the pillars gradually took an oblong form and became long, narrow walls, widened a little at the ends to give more support to the roof of the roadways. When John Watson visited Scremerston Colliery, near Berwick, in 1749, he noted in his Diary that the bords and headways were 10 or 11 feet wide, and that the supporting pillars were from 8 to 10 feet thick and 18 feet long.¹ And in the deeper pits of the early nineteenth century the pillars were of the same form, but both length and width had been substantially increased. At one northern colliery in 1811 they were 24 yards by 10, and at another, in 1812, 26 yards long and 8 yards across.²

The sight of such wealth lying untouched must always have irked the collier anxious to increase his daily output, for it was much easier to win coal from the pillars than to hack it from the face of a bord. Surreptitious nibbling at the pillars is known to have taken place at Shibden Hall, near Halifax, as early as 1713; and as coal rose in price the temptation to the proprietor, no less than to the collier, must sometimes have proved irresistible. The deliberate and authorised *robbing* of the pillars perhaps began in the Great Northern Coalfield in the seventeen-thirties:³ large columns of coal were left to support the roof on a first working, but after the bords had been exhausted, slices were cut from the ends of the pillars, or *jenkins* were made through them. By the middle of the century it is clear that the whole of the coal was sometimes removed, for in 1753 John Watson reported that a pit at Gosforth was wrought out both "whole and

¹ *Journal*, February 13, 1748/9.

³ *Ibid.* 254-5.

² Galloway, *op. cit.* 395.

walls", and in 1765 at Long Benton the practice led to the subsidence of a village street.¹

As the centre of production moved from the region west of Newcastle to the deeper coal of the Tyne basin, pillar working almost inevitably led to *thrusts* (irregular roof pressure often resulting in falls) and *creeps* (risings of the floor around the attenuated pillars). Moreover, in many of these deeper mines the risk of explosion was too great to allow of a second working; and from pits of 100 fathoms only about 40 per cent of the coal could be removed.² It was not until 1795 that a partial solution was found, when Thomas Barnes, who, at the age of 16, had taken over the management of Walker Colliery, introduced the practice of *panel working*.³ The colliery was divided into sections, of from 10 to 20 acres, round each of which were built *biggins*, or walls of stone and refuse, 40 or 50 yards in thickness. With this aid it was possible to take half of every second pillar, or a quarter of the coal that would otherwise have been left behind. The method had the further advantage that when a panel had been worked out it could be shut off, and the escape of foul or inflammable gases to the rest of the workings was thus prevented.

Geological differences naturally led to modifications in colliery practice, but the broad principles of the bord and pillar system were adopted throughout the coal-fields of northern England and Scotland. In Northumberland and Durham each hewer worked alone in his own bord, though later in the century he was often assisted by a marrow or companion. "In the process of hewing the coal from its bed, the hewer first digs as far as he can into the bottom of the stratum; then he nooks or corners off the part measured out, and afterwards the great coals come away by a wedge or mallet".⁴ The hewer was concerned solely with cutting the coal, and usually under-

¹ *Trans. N. E. Inst. Min. Engrs.* xxxviii. 190; Galloway, *op. cit.* 267.

² Bulman and Redmayne, *op. cit.* 16.

³ For Barnes, see H. W. Dickinson and Rhys Jenkins, *James Watt and the Steam Engine*, 253*n*.

⁴ Brand, *op. cit.* ii. 681.

took to do a fixed stint each day or, in default, to suffer a loss of wages: the removal of the coal was no concern of his, and when he had finished his task he was free to go home.

It was the business of the barrowman or putter to fill the coal into corves or baskets, load these on the wooden sledges or trams, and drag, push, or haul them to the pit bottom. Later in the century the putters worked in pairs, one youth pulling the tram by cords, known as *soams*, the other pushing from behind. At the pit bottom an onsetter hung the corves on the rope, and a brakesman or windsman drew them to the pit-eye and delivered them to the two banksmen, who carried them on a sledge to the coal-heap, where they were exposed for sale. It was the special duty of one of these banksmen (the Over-Man of the Tree) to keep account of the number of corves sent to the surface by each hewer, and in this he was aided by sticks of wood set in each corf before it left the underground workings. He had also to see that the corves were woodful (filled to the top), and to examine their contents, "for otherwise both the Hewers and Barrow-Men will confederate under Ground, and . . . they will be sometimes so Roguish as to set those big Coals so hollow at the Corfe bottom, and cover them with some small Coals at the top of the Corves".¹ For these services this prototype of the modern weighman received an addition of 2d. a day to the 14d. which was the pay of the ordinary banksman in the early years of the century.

At the beginning of the period the corf was said to hold 14 or 15 pecks of coal; in 1787 it held nearly $4\frac{1}{2}$ bushels, or about 5 hundredweights. It is clear, however, that it varied from place to place and that its capacity might be reduced by wear and tear, for it was constantly being dashed against the sides of the shaft. Since the coal-owner paid the hewer by the corf it was important that it should be maintained at full measure, and

¹ *Compleat Collier*, 32.

the corver who made or repaired the baskets had, therefore, a responsible office. He was paid a fixed sum— $4\frac{1}{2}$ d. in 1787—for every score of corves brought up the shaft, so long as he kept them to exact measure and supplied the pit with the quantity required.¹

At the larger pits a deputy overman, or under-overman as he was sometimes called, superintended the work, saw that the supporting pillars were properly maintained, and dealt with threatened falls of the roof. Above him was the overman, who saw to such matters as ventilation and assigned to each miner his place in the bords or headways. The overman was ultimately responsible for the pit and reported directly to the viewer—the all-important manager, engineer, and surveyor, who directed the working of the colliery as a whole.

As the century progressed specialisation of labour was carried to a high degree in this coalfield, and manual operations were subdivided so as to adjust the task to the capacity of workers of different ages:

“Boys enter the subterraneous workings at the age of 7 or 8, sometimes as early as 6 [wrote a colliery viewer in 1800].² They are first Trap doorkeepers, being employed to open and shut doors fixed for conducting air round the works while the coals are passing through them from the Workmen to the Shaft; their Wages are 6d. a day; they continue in this situation 4 or 5 years when they become what are termed lads or foals, supplying the inferior place at a machine called a Tram, where two are employed, and made use of to convey the Coals from the workmen to the Pit’s mouth; their wages from 9d. to 12d. per day according to the earnings of the

¹ Brand, *History of Newcastle*, 681n. At Old Byermoor Colliery, in April 1746, the breadth of the corf “within the womb” was 38 in., and at the mouth 34 in.; its height was 31 in., and its length 34 in. (*Journal of John Watson*, April 3, 1746). At Rothwell Haigh Colliery in 1838 its dimensions were 36 in. by 28 $\frac{3}{4}$ in. by 22 $\frac{1}{4}$ in. (*Rothwell MSS.*).

² *Replies by W. Thomas of Denton to Queries made by Sir John Swinburne concerning the State of Pitmen on the Tyne*. MS. in N. of Eng. Inst. of Mining Engineers, Newcastle-upon-Tyne, v. 3, 92.

Tram which is paid a certain price for every score or 20 Baskets of Coals in proportion to the distance of the workings from the Shaft”.

After two or three years in this subordinate position a youth became a half-marrow, when he received half the earnings of the tram, or 14d. to 16d. a day. Later he became a headsman, putting the tram with a lad or foal and taking two-thirds of the earnings of the tram. The next step up the industrial ladder was to the position of put-and-hewer, when half the day was spent at the tram and the other half in working coal. During the period in which the young man occupied this place he was learning the technique of hewing, and was paid 2s. to 2s. 6d. a day. He rarely continued as put-and-hewer for more than a year, for besides the inducement of the higher earnings which full-time getting obtained, there was the incentive of fewer hours of labour: whereas during this long apprenticeship from the age of 6 or 7 he had worked 12 to 18 hours a day, when he became a finished collier (a hewer) his working day was of 8, or, at the most, 10 hours' duration.

Records of mining accidents in 1705 and 1708 indicate that women were employed underground, but it is likely that their numbers diminished as the industry grew in scale, and few were employed in the Great Northern Coalfield after 1780. By the end of the century the only females engaged about the collieries were girls of from 11 to 16 years of age employed in *wailing* (picking out stones or dirt from the coal) at the pit-head, for an average wage of 6d. a day.¹

In the neighbouring coalfield of West Cumberland methods of work were very similar to those of Northumberland and Durham, though the strong dip of the strata produced some modifications. The mine was usually entered by a bearmouth, from which steeply sloping roads led to the workings, but the coal was raised to the surface through vertical shafts. “Their

¹ Galloway, *op. cit.* 232, 234, and W. Thomas, *loc. cit.*

method of digging [wrote Dr. Stukely¹ in 1725] is generally to run the grooves in a strait line, others going out on both sides at right angles; so that square pillars of coal are left to support the incumbent rock; hence some roads are made along the descent and others parallel to the declivity". Evidently the tendency to convert the pillars into narrow walls of coal never existed in this area. When a viewer from the Tyne visited Whitehaven in March 1749/50 he found pillars 13 yards square;² fifteen years later, according to M. Jars, they were 15 yards square, and the working places were only 5 yards across; while in the deeper pits of the opening years of the nineteenth century the pillars were 18 to 20 yards square. Since pillar working was not introduced here till later the bulk of the coal must have been left standing in the mine.³

In a pit at Greenbank Colliery (Cumberland) in 1675 there were five haggars, who corresponded to the hewers of the Tyne; the coal was removed by four bearers (almost certainly women), who carried the corves on their backs; and there were specialised windsmen, watermen, and banksmen. By 1709 the bearers had been replaced by trailers, who, like the putters of Northumberland and Durham, dragged or pushed the corves on sledges mounted on ashen runners. But, apart from this development, little change took place during the century. The accounts of Howgill Colliery in 1800 show the same classes of labour performing the same functions; but women were now chiefly concerned with filling the baskets, hanging-on at the pit bottom, and tending the underground ways; and boys were employed to open and shut the doors which regulated the ventilation of the pit, as well as to drive the horses which now drew the coal in waggons along the main roads.⁴

¹ Cited Galloway, *op. cit.* 346.

² *Journal of John Watson.*

³ Galloway, *op. cit.* 355-6.

⁴ *Watson Coll.: Accounts of Howgill Colliery*, 3093.

The Scottish stoop and room system was also essentially the same as the bord and pillar system of Northumberland and Durham. In parts of Scotland, however, the seams were very steeply inclined, and in such places it was customary to drive a shaft to the lowest point and work the coal by stages upward, much in the manner of "stoping" in winning metalliferous veins. "All coall hes a dipp and crope, the less it dippes the better [wrote Sir Peter Halkett¹ in 1725]. . . . The levell roome should always be carried on before the rest and is the lowest can be wrought for water; and the rest of the rooms must follow graduallie on another from the levell roome to the highest roome in the crope".

The classes of hewers, windsmen, watermen, and gatesmen (or repairers of the underground ways) enumerated in Scottish legislation in the seventeenth century are the counterpart of similar classes in England. The chief difference between the conditions of labour in Scotland and those in Northumberland and Durham consists of the more extensive use of women and girls. The hewing, it is true, was usually done by men, though in Lanarkshire there was a seam, "the woman's coal", entirely worked by females. The male hewer in Scotland invariably engaged not only to cut the coal but also to draw it to the pit bottom; and this last operation was almost exclusively confined to women employed by him and not directly by the owner of the colliery. Where the seams were but slightly inclined the coal could be carried or drawn on sledges to the shaft, and then wound to the surface. But where the strata were much deranged by dikes, and in the edge-seams of the east of the country, it was carried, not only along the underground ways, but by stairs or ladders to the pit-head on the backs of the wives and daughters of the colliers.

Of the conditions of their labour in the opening years of the nineteenth century a graphic description is

¹ *Hist. MSS. Comm., Drummond Moray MSS., 153.*

given by Bald.¹ It was customary for the man, accompanied by his sons, to go to work about eleven o'clock at night.

"In about three hours after, his wife (attended by her daughters, if she has any sufficiently grown) sets out for the pit, having previously wrapped her infant child in a blanket, and left it to the care of an old woman, who for a small gratuity, keeps three or four children at a time, and who, in their mother's absence, feeds them with ale or whisky, mixed with water. . . .

"The mother . . . descends the pit with her older daughters, when each, having a basket of a suitable form, lays it down, and into it the large coals are rolled; and such is the weight carried, that it frequently takes two men to lift the burden upon their backs: the girls are loaded according to their strength. The mother sets out first, carrying a lighted candle in her teeth; the girls follow, and in this manner they proceed to the pit bottom, and with weary steps and slow, ascend the stairs, halting occasionally to draw breath, till they arrive at the hill or pit top, where the coals are laid down for sale; and in this manner they go for eight or ten hours almost without resting. It is no uncommon thing to see them, when ascending the pit, weeping most bitterly, from the excessive severity of their labour; but the instant they have laid down their burden on the hill, they resume their cheerfulness, and return down the pit singing".

The creel or basket had a supporting strap that passed round the forehead. It would hold as much as 170 lbs. of coal, and a woman might bear such a load a distance of 150 yards underground, then ascend with it 117 feet to the surface, and finally carry it 20 yards farther to the pit hill. And this she might do as often as twenty-four times in the course of the day. When the hewers had no female relatives, they would secure from the overman of the pit the services of women,

¹ *General View of the Coal Trade*, 131.

known as fremd bearers, who were unattached to any coal-miner's family. These unfortunates had not even the protection which the self-interest of the slave-owner ensures to the slave, for they were transferred from one hewer to another and might find themselves in the service of a new master each day. Their story will form one of the most sombre chapters in that history of the working classes that has yet to be written.

In the smaller coalfields of Lancashire, Yorkshire, and Derbyshire the methods and conditions of work were for long substantially the same as in the North-Eastern Coalfield. A seventeenth-century manuscript of the Bradshaighs of Haigh, near Wigan, shows a division of the pit crew into hewers, drawers, winders, treaders, and takers of cannel at the pit-eye, all under the supervision of an auditor, who corresponded to the overman of the Tyne collieries; and a regulation that no hewer "shall make or shape anye pillar or pillars under a yard and sixteen inches on the syde Nor under a yard and a half and sixteen inches on the ends", proves the existence of the traditional method of working.¹ A single extract from a Cannel Pit Book² of 1770-1785 will suffice to demonstrate not only that the method was still employed in the later part of the following century, but also that the working of the pillars, which has been noticed elsewhere, was not unknown in Lancashire:

Oct. 25, 1777. By paid for Walling Pillars to secure the works	£	s.	d.
where the Workmen had robbed the pillars	.	.	40 4 9

Of the methods of work at Worsley in the earlier part of the century the Bridgewater manuscripts give little indication, but some form of bord and pillar was almost certainly employed, and the hiring of corvers from Newcastle indicates that it was to the northern coalfield that the Duke looked for part, at least, of his

¹ A. J. Hawkes, *Catalogue of Jubilee Exhibition of Early Mining Literature*, Wigan (1928), p. 1. ² Relating to Peter Grimshaw's Heys Pit.

² Relating to Peter Grimshaw's Heys Pit.

specialised labour.¹ As will be shown later, however, at some of his pits an entirely new system of working was introduced during the seventeen-sixties.

In Yorkshire, where pits were small until the opening of Middleton and Rothwell collieries, methods were substantially the same, though the bords were much wider than in the North-Eastern Coalfield.² References to these bords occur in the books of Rothwell Colliery in 1809; and since the Brandlings, who owned Middleton, came from Durham, they too would naturally follow the same broad principles of working. In Sheffield, John Curr, the famous viewer of the Duke of Norfolk's colliery, conducted the pits by methods he had learnt in Durham in early life; and though substantial improvements were introduced by him in underground transport and winding, the processes of working the coal remained much the same as before. Over the county boundary a colliery near Chatsworth Park was certainly worked by bord and pillar in 1811; and a surveyor's account of another Derbyshire colliery at Whittington, near Chesterfield, proves that pillar working was practised in 1821, and that eight-ninths of the coal was being removed from the earth.³

II

It is probable that the bord and pillar method was employed at first in coalfields other than those to which attention has here been called, and it was certainly used in some parts of South Wales in the late eighteenth century. But in the principal coal-producing areas of the English Midlands another method, known as longway or longwall working, had by this time come into favour.

Under this method the whole of the coal was re-

¹ *Infra*, 154.

² Galloway, *op. cit.* 204.

³ *Duke of Devonshire's MSS. Letter to J. P. Cockerall, Esq., October 1912; Surveyor's Memo. Book, 1821.* The old pillars of the Chatsworth Colliery were worked during the coal strike of 1912, in order to get slack for the greenhouses at Chatsworth House.

moved by a single operation; the workings were pushed forward in a long continuous line; and as the colliers advanced the *gob* or *goaf*, as the space from which the coal had been taken was called, was packed with stone, slack, and rubbish, on which the roof was allowed to settle. The main passages or working gates ran through the goaf, and in the larger mines it was necessary to connect one working gate with another by cross-gates or connecting passages. These underground roads were maintained by constructing walls of stone on both sides, but there was a constant tendency for crush and creep to diminish their height, and much labour was expended in making cuttings in the roof or floor.

The system was peculiarly suited to the working of relatively thin seams, especially when the underlying and overlying strata were of hard material: when the coal had been undermined the pressure of the strata above helped to bring it down in large blocks, and, since no pillars were required except about the shaft, almost the whole of the coal could be taken away. It was therefore generally a more economical method than the bord and pillar; but, since the amount of subsidence was greater, it could not always be used in the neighbourhood of towns, or where it was important to maintain unimpaired the surface of the ground.

In pits using this method, as in those using the other, there was at first little division of labour. At Sir Richard Newdigate's Griff Colliery in 1701, for example, the underground workers fell into the two simple categories of getters and drawers. But by the end of the eighteenth century the process of getting by longwall had become subdivided between several classes:

"The working . . . commences, by a set of Colliers called Holers, who begin in the night, and hole or undermine all the bank or face of the Coal, by a channel or neck from 20 to 30 inches back, and 4 to 6 inches high in front, pecking out the holeing-stuff with a light and sharp tool called a pick, hack or maundrel: and placing

short struts of wood in such places where the coal seems likely to fall, in consequence of being so undermined. . . ."¹

"When the Holers have finished their operations through the whole length of the Bank, or Banks, and cut a vertical nick at one or each end of the Bank, called the cutting-end, and have retired, a new set of Men called Hammer-men, or Drivers, enter the works, and fall the Coal, by means of long and sharp iron wedges, set into the face of the Coal at top or near it . . . which they drive by large Hammers, till the Coal is forced down, and falls in large blocks, often many yards in length: . . . a man called the Rembler next follows, and with a hammer-pick breaks the blocks of Coal into sizeable pieces: and the drawing apparatus being ready, the loaders fill the Coals into the Corves or Trams. . . .

"A new set of Men now enter the Pit, called Punchers or Timberers, taking with them a number of stout posts of wood, cut or sawed off to a certain length, from very old Underwood or the thinnings of Plantations, or the straight arms of trees. These puncheons they set up in a row, in front of and almost touching the new face of the Coal, applying a small flat piece of wood, or templet, at top of each, unless the roof which they punch-to, as it is called, be very hard. . . . The work is now ready for the Holers to return, and after another day's work as above described, the Punchers return, and in pretty good roofs they take down the puncheons in succession and remove them forwards almost to the face of the Coal, as before".²

This description of longwall working relates to Derbyshire in the opening years of the nineteenth century; but the essential features were to be seen in the other coalfields of the English Midlands, not only at the same period, but, if allowance be made for the slighter division of labour, a century or more earlier. The method required the co-operation of several workers

¹ Farey, *Agriculture of Derbyshire*, i. 343.

² *Ibid.* 344-51.

in a single task, and the unit of employment, as will be shown later, was a gang or company of working colliers; whereas under the bord and pillar system each hewer worked in his own stall, either alone or accompanied by a single marrow. The differentiation of function among the manual workers can be seen even in relatively small mines: at Norbrigg Pit, near Killamarsh (Derbyshire), in 1815 the pit crew consisted of 5 holers, 1 hammerer, 1 river (or rembler), 2 loaders, 2 trammers or hurriers (putters), 1 hanger-on, and 1 banksman.¹

Just as there were local variants of the bord and pillar system, so also longway working was modified to meet the needs of particular areas. In Staffordshire and Worcestershire, in particular, the ten-yard seam required special methods. In the seventeenth century it had been possible in some places to work this extraordinary stratum by open quarries, but long before the opening of the eighteenth most of the outcrop coal had been exhausted and the typical working was a pit of perhaps 120 feet in depth. It was customary to begin work at the bottom of the ten-yard seam, "the Colliers getting the nethermost part of the Coles first, about two yards in height or more, and when they have wrought the Crutes or Staules (as some Colliers call them) as broad and as far in under the ground, as they think fit, they throw the small Coles . . . out of the way on heaps to raise them so high to stand upon, with the working of their Picks or Maundrills over their heads". The coal could thus be brought down in huge blocks each weighing several tons, though the heavy fall produced an inordinate quantity of slack and smalls.²

In some of the Staffordshire collieries the special liability of the coal to spontaneous ignition led to a system of work that combined features of the bord and

¹ Sorby, *loc. cit.* 92.

² Dud Dudley, *Mettallum Martis*, 24. At a later period the difficulty was overcome by working the seam in two or more layers or sections.

stall method with those of longwall. The area to be worked was divided into large compartments surrounded by walls of solid coal, known as *fire ribs*. Within a compartment pillars were left to support the roof, and here and there in the fire ribs small openings were made for the conveyance of coal to the drawing roads. The supporting columns of coal in a compartment were of two types: the *eternal pillars*, which were never worked, and the *man-of-war pillars*, which at the end of operations in a compartment were cut into the shape of cones with the apex in the roof. It was the business of a workman known as a pricker to detach the top of the cone from the stratum above and then bring down the pillar. When the last of the coal that could be got had been removed the openings in the barriers were closed by air-tight stoppings, and the compartment was thus sealed up.¹

Longwall working originated in Shropshire, perhaps in the early or middle seventeenth century; its invasion of other coalfields where one modification or another of bord and pillar work had previously been employed is one of the outstanding developments in the technical history of coal-mining—a development, however, in which the stages are not very easy to trace. Early in the eighteenth century the new method was almost certainly established in the Somersetshire coalfield.² That it had reached Warwickshire during the seventeen-twenties is indicated by entries of expenses of bringing men from Shropshire to work the pits at Griff, and by the system of organisation there.³ Its use in parts of Derbyshire soon after the middle of the century is attested by numerous references in the account book of Barlow Colliery; and its later development in this region has already been described. Extension to the northern coalfields appears to have taken place during the second half of the century. In 1760

¹ Galloway, *op. cit.*; T. Smith, *The Miner's Guide* (1846), 14.

² Galloway, *op. cit.* 341.

³ *Infra*, 153, 101-3.

Dr. Roebuck took colliers from Shropshire to work his mines at Kinneil, and later on the method could be seen in operation at Kinnaird, Clackmannan, and Cleland collieries in Scotland.¹ At Warnell Fell Colliery, Sebergham, in the East Cumberland coalfield, longwall working was employed soon after the middle of the century,² and it even penetrated to Northumberland in the isolated Scremerston coalfield.³

During the 'sixties the Duke of Bridgewater brought labour from Shropshire to work by longwall at Worsley in Lancashire;⁴ and the extension of the method to the Wigan area can be traced in the wages books of the Earl of Balcarres, whose ancestors, the Bradshaighs, had mined cannel at Haigh for generations by the traditional method. Alongside the statements for the cannel-pits there appear, for the first time in 1786, those for two coal-pits. The cannel-pits were worked, as in previous years, by men with such local names as Grimshaw, Pendlebury, and Winstanley, each of whom was paid individually for the cannel he got. The new coal-pits were conducted by companies of colliers bearing such exotic names as Dainty, Antoms, and Tranter, and the earnings were paid collectively. The origin of the newcomers is made clear by the following entry:

20 October 1787. Rob^t. Dainty, in Cash, for Expences going £ s. d.
into Shropshire to fetch colliers 1 11 6

And if any doubt remains as to what was taking place, it is set at rest by an inspection of the items of expenditure at the pits. In the cannel accounts there are occasional references to pillars; in the coal-pit accounts the only mention of pillars relates to the strengthening of the roof about the shaft. In the cannel accounts there are only small expenses for dressing the roads; in the coal-pit accounts frequent entries like the following suggest that the underground ways were in constant danger from creeps and crushes:

¹ Galloway, *op. cit.* 357.

² *V.C.H. Cumberland*, i. 352.

³ Galloway, *op. cit.* 357.

⁴ *Infra*, 153.

10	Feb. 1787.	for widening their drawing or Cungit it being	s.	d.
		nearly squeezed together	14	0
20	Oct. 1787.	Dainty & Co. widening and highering their		
		Galloway road, it being squeezed with a weight . . .	5	0

Finally in the same week as the second of these entries the practice of longwall working is clearly indicated by the payment of 5s. to Antoms & Co. for "heading their Wall out it being fall'n in, while they worked in Gilbert Close Pit".

Alone of the great coalfields those of the Tyne and Wear and of West Cumberland remained untouched by this invasion of Shropshire methods and by this infiltration of Shropshire labour. It was not until 1870 that longwall working was carried to Whitehaven, and it has never obtained a firm foothold in the collieries of Northumberland and Durham.¹ The reason, no doubt, is largely geological, for the nature of the roof and floor is unfavourable to longwall, and pillars are required to prevent subsidence where workings extend under rivers and sea, or beneath buildings and highways. Moreover, the early introduction of pillar working in these districts, by increasing the output of coal from a given area, reduced the costs of production, and so offset the chief advantage that had hitherto been claimed for the newer method. Whatever the cause, the bord and pillar system has remained the dominant mode of working in these northern coalfields to our own day. Its persistence is of more than merely technical interest: it has sociological import; for it helps to explain the survival there, more than elsewhere, of old customs and habits of mind. The pride of craftsmanship, the resourcefulness and individualism of the Northumberland and Durham miner, are ancestral traits that have remained unimpaired largely because the years have produced so slight a change in the daily task of the hewer of coal.²

¹ *V.G.H. Cumberland*, ii. 351.

² Welbourne, *The Miners' Unions of Northumberland and Durham*, 11.

CHAPTER III

THE COMBAT WITH WATER AND FIRE

He bindeth the streams that they trickle not.
And the thing that is hid bringeth he forth to light.
JOB xxviii. 11 (R.V.)

A fire not blown by man shall devour him.
JOB xx. 26 (R.V.)

I

IN the age-long struggle of the miner against fire and water, the latter at first appeared the more formidable. "Were it not for water, a colliery might be called a golden mine to purpose", says a writer of 1708; and a century and a half later it was said that at some pits eighteen times as much water as coal was raised to the surface.¹

In early times sinking was largely confined to elevated ground so that the water could flow away through soughs driven from the pit bottom to the side of the hill. The use of this method in the Forest of Dean is attested by an edict of the Mine Court of 1678 that after a miner had constructed such a level no other should sink a pit within 100 yards of it—a distance that was increased as pits grew deeper and more extensive, in 1692 to 300, in 1728 to 500, and in 1754 to 1000 yards.² In other coalfields soughs were sometimes constructed on such a scale that each drained several square miles of coal. Famous in the seventeenth century were those carried out by the first Sir Roger Bradshaigh at Haigh in Lancashire, by Sir Robert Cunningham at Stevenston in Ayrshire, and by Sir

¹ *The Compleat Collier*; Dunn, *Winning and Working of Collieries*.

² H. G. Nicholls, *Forest of Dean*, 232-3.

James Lowther at Whitehaven;¹ and among the great engineering feats of the eighteenth century were the soughs constructed by the Duke of Abercorn at Duddingston, and by William Adam at Pinkie, near Edinburgh.² In 1807 Farey prepared a list of thirty-three of these water-courses, some of them two or three miles in length, which drained the coal-pits and lead-mines of the county of Derby.³ At Worsley, in Lancashire, the series of tunnels constructed by the Duke of Bridgewater served the double purpose of draining the colliery and providing means of underground transport, and the same was true of Kitty's Drift, carried from Old Kenton Colliery for nearly two miles to the River Tyne.⁴

Where, however, configuration did not allow of this direct method of draining, apparatus had to be set up to raise the water; and since at this period mining was confined to the watery strata relatively near the surface, a large part of the capital outlay of the coal-owner was for this purpose. As early as 1600 a patent had been granted to a Balcarres for his machine for drawing water, and the attention given to the problem in all parts of the country is shown by the long list of his successors in the patent files of the seventeenth and eighteenth centuries.⁵

Among the early devices were the common hand-pump and the chain of pots. The latter was an endless chain, with buckets attached, like a dredging machine. The chain was moved by a windlass at the pit head, and as the full buckets passed over the axle they discharged their contents into a trough, from which the water flowed away down the pit bank. The great defect of this ap-

¹ *New Stat. Acct. of Scotland*, v. 439; R. W. Moore, *Trans. Inst. Min. Engrs.* vii. 620. At the present day drainage tunnels are sometimes maintained for the benefit of whole areas by such bodies as the South Staffordshire Mines Drainage Commissioners and the Halkyn Mines Drainage Commissioners—though much of the water thus drained is *pumped* up special shafts.

² *New Stat. Acct. of Scotland*, i. 250, 383.

³ *Agric. of Derbyshire*, i. 328-31.

⁴ Galloway, *op. cit.* 268.

⁵ *Abridgments of Specifications of Patents relating to Hydraulics*, 1617-1865. Nos. 8, 48, 49, 67, 76, 84, 110, 131, for the seventeenth century; Nos. 648, 730, 871, etc., for the eighteenth.

paratus was the continual spilling or leaking from the buckets, which produced a constant cascade in the shaft.¹ For this reason circular plates were often substituted for the buckets: the chain to which these were attached passed through a pipe of the same diameter as the plates, and, as it was drawn round, the water was carried to the surface.

When the lift required was greater than thirty fathoms it was usual to sink a second pit to about half this depth: the water was raised up the main shaft as far as convenient, and was then allowed to flow through an adit to the second pit, from which it was subsequently lifted to the top. Sometimes two or three of these water-pits were sunk to different depths, so that the operation of raising water could be divided into a series of relatively small lifts.²

Treadmills moved by men, or gins turned by horses, often took the place of the windlass, and at several Scottish collieries motive power was supplied by windmills. More common, however, especially in the north of England, were water-wheels. In the seventeenth century a Sir Thomas Liddell had erected a series of these, one high up on pillars, a second on the ground level, and a third in a well below the surface. Water that had passed over the first wheel thus served to work the second, and, after passing from this over the third, it flowed away by an adit to the river.³ But generally a single water-wheel, turning what was called a bobgin, sufficed for the shallow pits of this period.⁴

Devices depending on the power of wind or of falling water could not be relied upon for continuous work, and as mining developed increasing attention was given to the search for other forms of power. The nearest approach to a technical revolution in the coal industry

¹ Bald, *General View* (1808), 6; Galloway, *op. cit.* 158.

² Bald, *op. cit.* 7.

³ Galloway, *op. cit.* 159, citing Sinclair's *Hydrostatics*.

⁴ There were two at Chester-le-Street in 1725 (*Hist. MSS. Comm., Portland MSS.*, vi. 103).

came at the beginning of our period with the invention by Thomas Savery and Thomas Newcomen of their atmospheric or fire engine. This was, from the start, a mining appliance, and when Savery first announced his invention he called his engine *The Miners' Friend*.

It is unnecessary here to describe the gropings of earlier explorers — the experiments of von Guericke with the air-pump, of Huyghens with the expansive power of gunpowder, and of Papin with the vacuum created by the condensation of steam. Suffice it to say that, important as these were to the progress of pure science, they had no practical results, and it was left to Savery and Newcomen effectually to harness for industrial purposes the forces of atmospheric and steam pressure.

The fragmentary records of the two inventors have recently been brought together by Mr. Rhys Jenkins, and much that was obscure has been made plain.¹ A Devonshire man, Savery was born probably about the middle of the seventeenth century and died in 1715. In the early sixteen-nineties he had patented a process of grinding and polishing mirrors and coach-glass plates, and had also devised an apparatus for propelling ships by paddle-wheels worked by capstans on board the vessels. His fire-engine patent was dated July 1698; but some time before this the inventor had exhibited a model to the King at Hampton Court. The engine made direct use of steam pressure as well as of atmospheric pressure. Steam from a boiler was admitted to a receiver, from the lower end of which proceeded a suction pipe, and from the upper a force pipe, or outlet, for the water that was to be pumped. When the receiver was full of steam a further supply was cut off; cold water was then poured on the outside and water rushed up the suction pipe to fill the vacuum thus created. When this operation was complete steam was again admitted to the receiver, and the pressure of this drove the water away up the force pipe.

¹ *Transactions of the Newcomen Society*, iii.

As a means of raising water to a moderate height the device was effective. When it was used by Savery, for the first time, in a potter's house at Lambeth, the jet was so strong that it is said to have raised the tiles on the roof. The inventor claimed that it could be made to suck water from a depth of 22 to 26 feet and then force it to a further height of 60 or 80 feet; and it is known to have pumped water from a depth of 16 and forced it to a height of 42 feet. Savery used it to raise water at Campden House, Kensington, and other places; and in 1702, after setting up a "workhouse" in Salisbury Court, he issued a public advertisement offering to supply the machine to mines and collieries.

Here, however, real difficulties were met with, and it seems likely that the engine erected at a colliery near Wednesbury was unsuccessful. The forcing of high-pressure steam directly against a body of water must have resulted in much condensation, and the absence of safety valves must have entailed considerable danger. It was perhaps these defects that led Newcomen to separate the condenser from the receiver, and to rely on atmospheric pressure alone for his water-raising power.

Thomas Newcomen was born in 1663 at Dartmouth, and it was here that, as a young man, he set up in business as an ironmonger. It seems probable that he was making experiments with steam-power at the time when Savery obtained his patent; and the grant of this in 1698 for fourteen years, with its subsequent extension for twenty-one more years, may have caused Newcomen to despair of a separate patent. The date of his own invention is unknown, but in 1711 he made proposals to draw the water at Griff Colliery; and the details of his engine are clearly exhibited in an engraving dated 1717, made by Henry Beighton, a native of Griff and a friend of the Newdigate family who owned the colliery there. It is highly probable, therefore, that a Newcomen engine was erected at Griff before this date.

In this engine a cylinder with a piston was fixed

above the boiler: the piston was coupled to one end of a beam, which moved on a central pivot, and to the other end of the beam were attached the rods which worked the pumps. When steam was admitted to the cylinder the piston was raised by the weight of the pump rods; when a vacuum was produced by the injection of cold water the piston was forced down by atmospheric pressure; and these movements at one end of the beam produced a pumping action at the other.

A company of London capitalists, known as "The Proprietors of the Invention for raising Water by Fire", was formed, perhaps upon the death of Savery in 1715; and during the following ten years engines were supplied to colliery owners in various parts of the country—among them Stanier Parrot of Fackley and Hawkesbury Collieries, and Sir Richard Newdigate of Griff Colliery, in Warwickshire; Richard Beech of Walton, near Stone in Staffordshire; James Lowther of Whitehaven; Andrew Wauchope of Edmondstone in Midlothian; and the proprietors of Washington Colliery near Newcastle, and Austhorpe Colliery near Leeds. The conditions of supply were closely parallel to those adopted by Boulton and Watt at a later date. The colliery owner was required to purchase the cylinders and other parts, to meet the cost of erection, and to pay a periodic rent for the use of the engine. At Whitehaven the annual rent of a single engine was £182, at Griff £300, at Edmondstone £320; and at the last of these the tacksman or lessee of the mine agreed to pay the engineers £200 a year and half the net profits of the colliery, in return for their services in keeping the engine at work.¹ When, however, the end of the patent drew near, in 1733, the right to use engines was sometimes sold for a capital sum—again a practice followed seventy-five years later by Boulton and Watt.

In 1724 the proprietors had found it worth while to set up a resident agent at Chester-le-Street, and after

¹ Bald, *op. cit.* 22.

1733 the number of engines in use extended rapidly. The development of the technique of iron-founding by the Coalbrookdale Co., which supplied most of the parts, had much to do with the success of the machine,¹ and something also was due to the mechanical improvements effected by Smeaton later in the century. Essentially, however, the engine remained unchanged until, in 1769, James Watt separated the condenser from the cylinder and produced a steam, as distinct from an atmospheric, engine.

The story of this steam-engine is too familiar to need retelling here. Several of the earliest of Watt's engines were built at collieries—notably the first (or second) ever supplied to an outside firm, the "Parliament Engine" erected for Messrs. Bentley at Bloomfield Colliery, near Tipton, in 1776. This was followed, in March 1777, by an engine at Hawkesbury Colliery, Bedworth, and in 1778 others were set up for John Wilkinson at Snedshill and for Peter Colevile at Torryburn, Fife-shire; while in the early 'eighties pumping engines were constructed at Doonane Colliery, near Carlow, and at Rothwell Haigh Colliery, near Leeds.²

Notwithstanding the technical superiority of the new engine, its adoption by the coal industry was exceedingly slow, and the older type predominated on the coalfields till well into the nineteenth century. When in 1769, the year of Watt's first patent, Smeaton drew up a list of atmospheric engines, he found evidence that a hundred had been erected about Newcastle-upon-Tyne, and that fifty-seven of these were at work in that year.³ At no time in the eighteenth century did the number of Watt engines even approach this figure. According to a recent

¹ *Vide* the following entry in *Sykes' Local Register*, 1763: "The cylinder for Walker Colliery arrived from Colebrook Dale; diameter 72 inches, length of stroke $10\frac{1}{2}$ feet, being the largest in the North of England. . . . It was considered a complete piece of work, and did honour to Colebrook Dale foundry in Shropshire, where it was manufactured" (*Bell Coll.* xx. 83).

² H. W. Dickinson and Rhys Jenkins, *James Watt and the Steam Engine*, 113, 115, 117, 118, 138, 145.

³ *Ibid.* 300.

investigation¹ only five of them were made between 1775 and 1785, twenty-two in the following decade, and only three during the remaining five years to 1800. The reason, no doubt, lay partly in the terms demanded by Boulton and Watt; but the backwardness was largely due to the fact that the saving of coal (the great merit of the invention in the eyes of the Cornish mine-owner) made little appeal to the colliery proprietor, who was often only too glad to find a use under the boilers for the soft, broken, unsaleable coal that cumbered his pit brow. Thus, although a Boulton-and-Watt pumping engine had been set up at Byker Colliery in 1778, nearly twenty years elapsed before another appeared in the Great Northern Coalfield;² and Farey,³ writing of the county of Derby as late as 1810, was able to say, "I met with no Pumping Engine on Boulton and Watt's principle at a Coal-Pit; the old Atmospheric well contrived and executed being thought to answer better in such situations". Clearly the steam-engine effected no such profound transformation of coal-mining as it did of cotton-spinning in the late eighteenth century.

How far, indeed, the coal-miner was from controlling the devastating power of underground water was tragically demonstrated by a number of inundations, of which that at Heaton Colliery in May 1815 was outstanding in horror. An attempt was being made to work into the old disused Jesmond Colliery, so as to get the coal left standing in the pillars. As the men were working through a "dyke" or "trouble" between the two pits, water burst from the old workings, and 75 men and boys were cut off from the only means of escape. So inadequate were the pumps at the disposal of engin-

¹ J. Lord, *Capital and Steam Power*, 167-70. Mr. Lord has apparently overlooked the Rothwell Haigh engine of 1783.

² *Ibid.* 244.

³ *Agric. of Derbyshire*, i. 339. Pumping engines on the Newcomen principle still exist at collieries in Somerset and Dean Forest. One at New Fane Colliery, Gloucestershire, is still in regular use, and at other collieries they are used as "stand by" engines.

eers, even as late as this time, that it was nine months before the water could be cleared. When at last the workings were reached, the full extent of the lingering torture by which death had come to the miners was revealed: the starving men had eaten their horses, candles, and even the bark from the fir props, and one man had not long been dead.¹ Such were the penalties of mining in deep seams before the days of modern pumps and pumping engines.

As early as 1797 Mr. Thomas of Denton had advocated the setting up of a Record Office where plans of old collieries could be inspected, so that such disasters might be avoided; and the proposal was supported by William Chapman in 1815 and John Buddle in 1834. But the individualism of the British mine-owner proved too strong, and no action was taken until 1840, when, as the result of memorials to the Treasury from several influential bodies, a Mining Record Office was established in London. Even to-day, however, the majority of such early mining plans as have been preserved have to be sought for in scattered private collections and in the estate offices of individual owners of collieries.

II

The war against the noxious gases that carry swift death to the miner was even more drawn out than that against water, and it was not until after the end of the eighteenth century that even a partial victory was registered. In adits and in the smaller pits of earlier centuries it was principally chokedamp (or carbonic acid gas) that troubled the miner; but, as pits became bigger and adequate ventilation more difficult, firedamp (methane or marsh gas) became the prime enemy. Chokedamp could put an end to the collier's life by suffocation, but it usually gave him warning of an attack by first putting out his candle; the dreaded firedamp might appear with-

¹ *What do the Pitmen want?* (1843), *Bell. Coll. i.* 472.

out warning and, exploded by the flame of his candle, might carry death and destruction throughout the colliery. "The Fire-damp [observed Farey¹] comes out of the newly opened joints in the Gates and workings, and seldom out of old hollows; while the black or Choak damp most prevails in old Hollows, and works which have stood still". Nevertheless the area from which the coal had been removed often served as a collecting chamber for firedamp; and in large pits where the waste was unventilated the miner carried on his daily work by the side of a veritable magazine.²

Explosions of gas are recorded from early times, but it is clear that their incidence became heavier during the eighteenth century. The success of colliery engineers in sinking through the water-laden strata greatly increased the menace; for firedamp is more abundant in the deeper seams, and the leakage of water in the shaft, which had set in motion a current of air, had now been reduced. Sometimes, as will be seen, simple systems of ventilation were set in operation; but the principles were not completely understood, and a mere dilution of firedamp with air, in the absence of a current sufficient to carry it away, often rendered it more explosive. At many collieries, too, the cost of constructing ventilating shafts was considered prohibitive.

The larger catastrophes have been recorded in other works, and we are spared the depressing task of chronicling them here. A casual survey of the books of any colliery working fiery seams suggests that accidents were very common, and many of the smaller ones would hardly be heard of; for no inquest was held on pitmen

¹ Farey, *op. cit.* 336.

² See, for example, the *Annual Register*, 1773, p. 151: "Dec. 6th. The foul air in an old waste of a colliery near the river Wear in Yorkshire, took fire, and breaking down the barrier or partition between the waste and the working pit, made the most terrible explosions ever beheld. The pit is said to be eighty fathoms deep; and everything in the way of the blast was thrown out at the mouth to the estimated height of 200 yards in the air. Most of the pit-men, having just in time discovered the danger, were drawn up, and escaped unhurt; but some boys, and one man, who were left behind, lost their lives".

killed in the mine in the north of England before 1814, and as late as 1842 the office of coroner did not exist in Scotland.¹ So frequent, it is said, had explosions become in the Great Northern Coalfield about the seventeenth-century that the *Newcastle Journal* was asked to make no reference to them. If the reason was fear that newspaper reports would deter the miners from going down the pits it was probably ill-founded, for the men of the eighteenth century faced the daily hazard with the same equanimity, not to say indifference, as their successors of to-day. In the absence of other means of illumination lighted candles had to be carried into the workings, and the peril of explosion arising from their use was one which could not be avoided. Sometimes, however, considerations of mere convenience would lead the miners to incur appalling risks: in January 1740 a large conflagration occurred at Tanfield Colliery as the result of the kindling of a fire to warm the men at their work;² and, at a later period, George Dixon, the reputed discoverer of coal gas, actually proposed to use it to illuminate the underground workings.³

For long the occurrence of explosions was regarded as inevitable, and attention was concentrated on the relief of the sufferers. The method of treating men rendered unconscious by chokedamp or the afterdamp that followed an explosion was to dig a hole in the ground, put the man's head in it, and cover it with fresh mould. If that proved ineffective, according to an early observer,⁴ "they tun them full of good ale; but if that fail they conclude them desperate".

¹ Broadsheet in *Bell Coll.* viii. 59; *Rept. of Children's Empl. Comm.* (1842), App. i. 394. Examples like the following could be multiplied:

"Meadow pit off Work owing to 4 Men being burnt from putting their Candles too near the Roof, where there happen'd to be an open thread. 2 of the men were sore burnt and the other 2 but slightly" (*Watson's Journal*, October 31, 1749, referring to Long Benton Colliery).

"1771, April 19. Wm. Lowe for loss of time when burnt with fiery Damp 15 Days 1s. . . . 15s." (Sir Roger Bradshaigh's *Cannel Pit Book*).

² *Gentleman's Magazine*, January 1740.

³ *V.C.H. Durham*, 243.

⁴ Mr. Jessop, cited Galloway, *op. cit.* 186.

At a later stage attempts were made to remove fire-damp either by producing a deliberate explosion or by ventilation. Firedamp, being lighter than air, tends to collect near the roof, and its presence could be detected by the experienced overman or viewer, who would place his candle on the floor of the mine, light it, and then slowly raise it, watching closely the changes in the flame. The presence of the gas was indicated by the appearance of a bluish cap or "ghost" at its tip.¹ If the firedamp was found in the shaft or at the pit bottom it could be removed, as it was at Wigan about the middle of the century, by lowering a lighted candle, or an iron basket filled with fire.² If, however, it had collected in some part of the workings, it was the business of a specialised fireman to enter the danger zone and explode the gas when the working colliers were out of the way. This adventurer, clad from head to foot in rags soaked in water, would crawl along the underground way holding in front of him a long pole at the end of which was a lighted candle. When the explosion occurred he would fling himself, face downward, on the floor, and so, with good

¹ At the beginning of the nineteenth century the candles were made of ox or sheep tallow, and forty-five of them went to the pound. The method of detecting gas was described by John Buddle as follows:

"In the first place the candle, called by the colliers the *low*, is trimmed—that is, the liquid fat is wiped off—the wick snuffed short, and carefully cleansed of red cinders, so that the flame may burn as purely as possible.

"The candle being thus prepared, is holden between the fingers and thumb of the one hand, and the palm of the other hand is placed between the eye of the observer and the flame, so that nothing but the spire of the flame can be seen as it gradually towers over the upper margin of the hand. The observation is generally commenced near the floor of the mine, and the light and the hand are gently raised upwards till the true state of the circulating current is ascertained.

"The first indication of the presence of inflammable air is a slight tinge of blue, or bluish grey colour, shooting up from the top of the spire of the candle, and terminating in a fine extended point. This spire increases in size, and receives a deeper tinge of blue, as it rises through an increased proportion of inflammable gas, till it reaches the firing point. But the experienced collier knows accurately enough all the varieties of *shew* (as it is called) upon the candle, and it is very rarely fired upon, excepting in cases of sudden discharges of inflammable gas".

See Nicholas Wood, "On Safety Lamps for Lighting Coal Mines", *Trans. N. of E. Inst. Min. Engrs.* i. 379-80.

² *V.C.H. Lancs.* ii. 358.

fortune, he might escape the flame which shot along the roof above him. Such was the method employed at Mostyn about the middle of the seventeenth century,¹ and with modifications it was used in all the principal coal-fields—with the exception of that of Northumberland and Durham—in the more gassy pits of the eighteenth century. In South Wales the practice was to make a hole, just large enough to hold a man, in the floor of the pit at that part where the gas had accumulated. The fireman fixed his candle to a board with clay, lighted it in an area known to be free of gas, and attached a string to the board. Holding the other end of the string, he entered the hole, pulled pieces of timber over the top for protection, and then drew the board with the lighted candle towards him till the explosion occurred. For this excitement he received the high, but surely not excessive, remuneration of 5s. a day.

In Staffordshire and Leicestershire a similar but less dangerous practice existed. A hook was fixed in the roof of the mine where the gas had concentrated and through this was looped a wire, both ends of which were passed to the pit bottom or some other region of relative safety. The wire was mounted on posts so as to hold it well above the floor, and at one end of it was fixed a lighted candle, weighted so as to keep it upright. By drawing in the other end of the wire the fireman caused the candle to travel forward until it exploded the damp: at the fiery pits of Lord Dudley, at Netherton (Staffs), about 1800, it was necessary to carry out this operation three times every day.² About the beginning of the nineteenth century Joseph Butler, of Killamarsh, near Chesterfield, used essentially the same method, but improved it by setting the lighted candle on a tram, which ran on lines, and was drawn by a rope passing over a pulley in the passage where the gas had gathered. In 1826 a clock-

¹ Galloway, *op. cit.* 220-21.

² H. G. Graves, "A Contribution to the History of Firedamp", *Trans. Fed. Inst. Min. Engrs.* vi. 242.

work apparatus which struck matches to ignite the gas was devised by one William Wood, and the same inventor adopted the practice of running wire, coated with inflammable material, through the workings, so that a light applied in the safety zone would cause a flame to travel to the point at which the gas was to be exploded.¹

All such methods, however, were fraught with danger to life as well as to the pit itself, and the true solution of the problems of gassy mines lay, it is now clear, in an effective system of ventilation. Progress in this matter was exceedingly slow. At Whitehaven, if the presence of firedamp was suspected in a newly opened shaft, the pit was allowed to stand idle, sometimes for years, in the hope that the gas would dissipate itself.² And in Derbyshire the approved method of expediting the process, even in the early years of the nineteenth century, consisted simply of making a fan of gorse or furze, which was lowered into the shaft and moved up and down rapidly several times, until the damp was sufficiently diluted to allow work to be resumed.³

Where, as in parts of Derbyshire and the Forest of Dean, mines were simple levels driven horizontally into the hill-side, a crude system of ventilation could be obtained by putting in a floor of timber, along which, incidentally, the miners could drag their sledges, and beneath which the water could flow away from the workings "to the day". If the floor were carefully constructed, and cracks in it stopped with clay, fresh air would pass in below, and the hot and impure air would flow out beneath the roof. In other places a similar result was achieved by cutting a groove in the side of the level and boarding it off: along this fresh air could be pumped by means of bellows, and the foul air would naturally return by the level. In the eighteenth century,

¹ H. C. Graves, "A Contribution to the History of Firedamp", *Trans. Fed. Inst. Min. Engrs.* vi. 243.

² *An Account of the Coal Mines near Whitehaven* (1801), 98.

³ Farey, *Agric. of Derbyshire*, i. 336.

however, it was more usual to sink vertical air-shafts to the level, in order to obtain an effective circulation. In the summer, when the outside air had a higher temperature, and therefore a lower density, than that in the pit, the air entered by the shaft and passed out by the level; and in winter the heavier external air entered by the level and the foul air passed out by the shaft. The building of a chimney over the shaft would increase the current, since it extended the column of air of the temperature and pressure of that in the pit.¹

In districts where the entrance to the workings was vertical the shaft was sometimes divided from top to bottom by boards: one side was then used for pumping, and down this the fresh air descended; the other was used for winding, and up this the used air ascended to the surface.² More frequently, however, a ventilating shaft, or bye-pit, was sunk at some distance from the winding shaft; and if the circulation of air which was thus set up were insufficient, it was increased by hanging in the bye-pit a basket of iron rods in which a large coal fire was constantly maintained. This method of ventilation was practised in Staffordshire as early as the seventeenth century, and it was also employed on the Tyne at Fatfield and Chartershaugh Collieries in 1732.³ At some places, instead of suspending a fire-basket in this way, a furnace was kept burning at the foot of the shaft. "A Large Lamp stands at the Bottom of this Shaft [wrote John Watson of a pit at Long Benton Colliery in 1749⁴] which they keep in continual blaze for the Convenience of Air etc. which makes the Shaft as bad to Ride as a Kitchen Chimney".

It was perhaps in order to avoid such discomfort, as well as for obvious reasons of safety, that at some pits

¹ Nicholls, *Forest of Dean*, 239; Farey, *op. cit.* 332; Galloway, *op. cit.* 286.

² Farey, *op. cit.* 333.

³ Galloway, *op. cit.* 194, 254. Furnace ventilation is still used at a few old mines, but it is illegal in any mine opened since 1912 which employs more than thirty persons. Coal Mines Act (1911), s. 31.

⁴ *Journal*, March 7, 1749.

the fire which set in motion the current of air was built above ground: this was certainly the practice at collieries on the Wear in 1760, where wooden pipes, two inches in diameter, were carried from the surface furnace to draw the air from the remote workings.¹ In Derbyshire at a later period, Joseph Butler used to sink a shaft of small diameter and no great depth, a short distance from his air shaft, with which it was connected by a narrow *thurl*, or tunnel, two yards below the surface. The air shaft itself was bricked over at the top and the fire-basket was suspended in the small shaft. In this way a stronger flow of air was produced, and the ashes from the fire-basket, instead of falling to the bottom of the pit, were collected in a place from which they could easily be removed.² It is clear, however, that Butler was not the first to use this method, for a similar arrangement is indicated by an entry in a book of the Duke of Bridgewater at a much earlier date:

1770, Oct. 17. for sinking 38 yds in Ladder Pitt and sinking £ s.
for a fire pitt 5 yrs and driving 3 yards between the Pitts 14 14

In the early days of ventilation the air was allowed to find its own way from one shaft to the other, and parts of the pit remained untouched by the fresh current. As workings grew in size, however, it was found that gas tended to accumulate in the waste, and in dead ends; and a fall of roof, or a change in atmospheric pressure, might set up a movement of blackdamp or firedamp from some such unventilated part of the pit to the working face. To meet this danger the practice grew up of making vertical *stoppings*, or partitions of wood or brick, in the gates and headways, and by a judicious arrangement it was possible to "thread" the air up one passage and down the next, so as to ensure that every part of the mine was swept by the current.³ In this matter of "coursing the air" Whitehaven was the pioneer, and

¹ *Annual Register*, vol. iii. (1760), 148.

² Farey, *op. cit.* 333-4.

³ Moore, *Trans. Inst. Min. Engrs.* vii. 623.

the use of stoppings in the colliery there was noted by John Wesley when he visited the place in May 1759: "When a coal-pit runs far under the ground, it is customary here to build a partition wall, nearly from the shaft to within three or four yards of the end, in order to make the air circulate, which then moves down one side of the wall, turns at the end, and then moves briskly up on the other side".¹ The system was devised, about the middle of the century, by one of the Speddings of Whitehaven—possibly by Carlisle Spedding, but more probably by his son James—and was introduced into the collieries of the Tyne and Wear about 1760.² It involved not only lateral stoppings, but doors which could be opened or shut according to the course which it was desired that the air should follow: many of them would always be shut except when the corves were passing through, and it was the duty of a new class of labour, the boy and girl trappers, to attend to the opening and shutting.

In the deep pits of the Tyne basin the air had sometimes to pass through many miles of workings, and when it reached the upcast shaft it was so loaded with gas that it often burst into flame. So great was the danger at Wallsend Colliery that a sentinel was per-

¹ *John Wesley's Journal* (ed. Carnock), iv. 314. The account continues as follows: "In a pit two miles from the town, which ran full four hundred yards under the ground, and had been long neglected, several parts of this wall were fallen down. Four men were sent down to repair it. They were about three hundred yards from the shaft, when the foul air took fire. In a moment it tore the wall from end to end; and, burning on till it came to the shaft, it then burst and went off like a large cannon. The men instantly fell on their faces, or they would have been burned to death in a few moments. One of them, who once knew the love of God (Andrew English), began crying aloud for mercy; but in a very short time his breath was stopped. The other three crept on their hands and knees, till two got to the shaft and were drawn up; but one of them died in a few minutes. John M'Combe was drawn up next, burned from head to foot but rejoicing and praising God. They then went down for Andrew, whom they found senseless: the very circumstance which saved his life. For, losing his senses, he lay flat on the ground, and the greatest part of the fire went over him; whereas had he gone forward on his hands and knees, he would undoubtedly have been burned to death. But life or death was welcome, for God had restored the light of his countenance".

² John Buddle, *First Report on Accidents in Coal Mines* (1814), 21.

manently stationed near the furnace: when the flame of his candle, or the furnace itself, gave indications that the return air was charged with gas almost to firing-point the men and animals were raised to the surface, and doors in the stoppings were thrown open so as to dilute the foul air with fresh.¹ If in these circumstances it was necessary to extinguish the furnace, the relighting of it was a hazardous operation. The risk was sometimes partially overcome, however, by putting highly inflammable materials in the furnace bed, withdrawing the men to the surface, and relighting the fire by means of a red-hot iron ring, which was slipped down a wire leading from the pit top.²

The danger of blasts set up by the furnace was greatly reduced by the introduction, about 1810, of John Buddle's system of compound ventilation. The incoming air was divided into two currents, and, since each had therefore to sweep through only half the workings, the air was less heavily charged with gas. Moreover that air current which was most loaded with gas was not allowed to pass over the flame, but was deflected from the level up an inclined passage, known as a *dumb drift*, so that it entered the upcast shaft well above the fire. The current of air was sometimes stimulated by the introduction of steam jets in the shaft, as well as by the use of air-pumps and hot cylinders.

Alongside these developments, the eighteenth century saw the beginnings of the scientific study of fire-damp and the conditions of its ignition; and again it was Whitehaven that took the lead. In sinking a pit at Saltom a blower of gas was encountered that could be dealt with only by damming the gas from the shaft by wooden tubbing and passing it through a pipe to the surface. Thus, no doubt, was suggested the possibility of carrying firedamp from the pit through leaden pipes to the laboratory of Dr. William Brownrigg, who,

¹ T. E. Forster, "Historical Notes on Wallsend Colliery", *Trans. Fed. Inst. Min. Engrs.* xv. 80.

² Galloway, *op. cit.* 394.

assisted by Carlisle Spedding, made extensive investigations into its nature.¹ Observing that the flow of gas varied with the movements of the mercury in his barometer, Dr. Brownrigg established a connection between atmospheric pressure and the explosive tendencies of the air in the mine, and was often able to give warning when the danger that threatened was exceptionally great.

Ventilation alone could not solve the problem of sudden outbursts from old workings: it was necessary also to find means of illumination that would not ignite the gas. As early as 1733 reference was made to the use of flint and steel for this purpose, and it seems possible that the steel mill was already in existence at this time. The invention of Carlisle Spedding, it consisted of a small toothed wheel which was made to turn a larger wheel of steel the edge of which revolved against a piece of flint, and so produced a shower of sparks that gave a light just sufficient to enable underground work to be carried on. This method of illumination, however, was expensive, for it was necessary for each working collier to have a boy beside him to operate the mill; and it is little wonder that, in all but the more gassy mines, the use of the tallow dip was preferred in spite of the risk. Moreover, a series of explosions in the seventeenth and eighteenth centuries proved that the steel mill had not eliminated all danger, and in the fiery mines of the Tyne the colliers sometimes tried to carry on their work by the feeble light of phosphorous and putrescent fish, while at Wallsend a mirror at the surface was used to throw the sunlight to men at work in a gassy shaft.²

¹ William Brownrigg, M.D., F.R.S. (1711-1800), a medical practitioner at Whitehaven, was the author of several essays on the damp arising in coal-mines. In 1741 he married Mary, daughter of John Spedding, and niece of Carlisle Spedding. Carlisle Spedding (1696-1755) was the son of the chief steward of the Lowthers and became the engineer or viewer of their collieries. In his youth he suffered in a pit explosion near Newcastle, and in August 1755 he lost his life in another. Joshua Dixon, *The Literary Life of Dr. Brownrigg* (1801).

² T. E. Forster, "Historical Notes on Wallsend Colliery", *Trans. Inst. Min. Engrs.* xv. 78.

In the opening years of the nineteenth century the mortality from explosions reached alarming proportions; and in the course of two years, it was said, over 600 persons were destroyed in the coal-mines of the Tyne and Wear.¹ After a blast at Felling Colliery in which 92 people lost their lives, a number of clergymen and mine-owners formed the Sunderland Society for Preventing Accidents in Coal-mines; it was for this body that John Buddle prepared his celebrated paper on the Ventilation of Mines; and it was at its invitation that Sir Humphry Davy turned his attention to devising a lamp that would burn in a coal-mine without exploding the firedamp, and that, unlike the water-insulated lantern which Dr. Clanny had recently invented, would not be too cumbersome or intricate for daily use.

The story of the safety lamp and the controversies that have raged as to its genesis fall outside the scope of this book.² Whether the miner owes a greater debt to the scientific insight of Sir Humphry Davy or to the practical genius of George Stephenson cannot be discussed. Suffice it to remark that the year 1815, when the experiments of both inventors were shown to have yielded fruit, must be regarded as a landmark in the history of the coal industry. Neither Davy nor Stephenson sought a patent or attempted to draw profit from his device; the lamps cost little to manufacture; and those of the Davy type especially were soon brought into use at gassy mines throughout the country. They were first introduced on the Tyne in January 1816; a month later they appeared at Whitehaven; and in June of the same year they were in use in Wales.³ That they had been adopted at Wakefield early in 1817 is shown by an entry in the Cash Book of Rothwell Haigh Colliery;⁴ and the record

¹ Robert Bakewell, *Observations on the Geology of Northumberland and Durham*, i. 392.

² For a full discussion see F. W. Hardwick and L. T. O'Shea, "Notes on the History of the Safety Lamp", *Trans. Inst. Min. Engrs.* li. 548.

³ Galloway, *op. cit.* 439.

⁴ "17 Mar. 1817. Sir Humy Davy Lamps, 12s. od." (*Rothwell MSS.*).

of an accident caused by a defective lamp proves that they were employed in the Bradford district about the same time.¹

It is well known that the safety lamp did not bring a marked fall in the number of colliery accidents. Its first effect was to encourage the working of deeper and more fiery seams and to make possible the removal of pillars from areas which were too dangerous to approach with naked lights. The inventors had provided the miner with a weapon of defence: armed with it he was led forward to meet fresh perils. They had sought to bring security of life: they achieved an increase in the output of coal. Such was the estimate of an observer thirty years after the first lamp was made; and there was much to justify it in the circumstances of underground life in the 'forties.² Since then research has done much to define the conditions that lead to explosions, and to make the device subserve the end for which it was brought into being. But how far the labours of Davy and Stephenson fall short of fulfilling the high expectations that were aroused in 1815 is amply demonstrated on almost every coalfield of our own day.

¹ *V.C.H. Yorks.* ii. 358.

² See the pamphlet, *What do the Pitmen want?* (1843).

CHAPTER IV

PROGRESS IN WINDING AND DRAWING

He breaketh open a shaft away from where men sojourn.
They are forgotten of the foot that passeth by;
They hang afar from men, they swing to and fro.

JOB xxviii. 4 (R.V.)

I

THE transport of coal from the face to the pit bottom, and thence to the pit eye, presented a whole series of problems to the coal-owner of the eighteenth century. In the small mines of the Forest of Dean the woodwork lining the square sides of the shaft was constructed in stages so as to serve as a ladder, and the bearers could carry the coal direct from the getter (hewer) to the banksman at the pit stack.¹ In the edge seams of the east of Scotland spiral staircases or ladders were set in the shaft, and here too the transport of the coal was performed in a single operation.

At most collieries, however, some mechanical apparatus existed for winding in the shaft; at the smaller and more backward the simple windlass turned by hand sufficed; at the larger the *cog-and-rung gin*, which consisted of a drum, mounted over the mouth of the pit, was more generally employed. Cogs at one end of the drum engaged with others on a horizontal wheel, and to the axle of this was fixed a stern-pole to which a horse was harnessed. As the horse walked or trotted round the track at the pit head the rope coiled on the drum, and the laden corves were drawn up the shaft: to lower the empty corves the horse was made to trot round in the reverse direction. The position of the drum

¹ *V.C.H. Gloucester*, ii. 230.

directly above the pit mouth had serious drawbacks: it impeded the work of the banksmen, and an explosion might throw the apparatus out of action at a moment when its efficient working was of vital importance. Towards the end of the seventeenth century the practice arose, therefore, of fixing a simple pulley at the pit head over which the winding-rope passed to a vertically mounted drum several yards away.

This *whim gin* offered several advantages. When shafts were sunk close together the rope could be changed from an exhausted pit to a new one without any change in the position of the gin itself;¹ there was no interference with pit-head operations; and since the drum could be made of greater diameter than that of the earlier apparatus, more rapid winding was possible.

At the beginning of the century the gins used at Griff Colliery were described as barrel gins and were set over the pit itself. Horses from Arbury Hall worked in relays, probably of six or eight hours, for twenty and twenty-two shifts were performed in a week, and some of these were night shifts. The horses were driven by boys, who received 4d. a shift.² At some of the smaller collieries a single horse sufficed to turn the apparatus, at others there were two, but the more usual number was four. At Sir Roger Bradshaigh's Curghey House Pit, in 1746, the whimsey or whim gin was worked by four horses, which trotted round a track four and three-quarter times, and travelled 151½ yards to draw a basket from a pit 76½ yards deep.³ As pits grew deeper, increased power was desired; and in the 'sixties at Walker Colliery on the Tyne an attempt was made to harness eight horses, running two abreast. The experiment seems, however, to have proved unsuccessful:⁴ four horses remained the maximum for convenient working, and overstrain had to be avoided by a reduction in the

¹ E. M. Percy in *Trans. N. Staffs. Inst. Min. Engrs.* vi. 242.

² *Griff MSS.*

³ *Halliwel MS.* Communicated by Rev. T. C. Porteus, M.A.

⁴ Galloway, *op. cit.* 276.

length of the shift. At Whitehaven, in 1801, where coal was being wound by four horses from a depth of 100 fathoms at the rate of 42 to 44 tons in nine hours, the horses worked in relays of three hours only.¹

The apparatus which raised the coal served also to lower and raise the workers. Sometimes men and boys were carried in the coal baskets; sometimes they sat astride a wooden "horse"; but the most common method, even as late as the forties of the nineteenth century, was for each man to insert a leg in a loop at the end of the winding rope, and, holding to the rope above him with one hand, use the other to prevent his body from being dashed against the sides of the shaft. Boys sat astride the knees of the men, or clung with their hands to the rope and twined their legs about it: a string of onions was the simile called to the mind of an early mines' commissioner by the clustered "bant" of colliers and boys riding the shaft. Accidents often resulted from falls of stone; and if the cry of "Hold out!" shouted by the banksman were disregarded by the hanger-on below, and a corf of coal were sent up when the bant of men was descending, a collision (termed by the miners a wedding) would occur in the shaft. Sometimes, too, casualties resulted from the failure of the primitive balancing devices used in winding. Oliver Heywood's *Diary*² records one at an early date: "A poor man that hath been a collier 40 yeares having carded wool for his living upon Aug. 14, 1673, and got but two pence that day said nothing is got with this working Ile into the colepit again tomorrow, and I'le never come up again, in the morning he went to the colepit belonging to Mr. Rooks at Rhodes-hall, they let him down in a scoop or basket, there being a peece of wood at the other end of the rope to poyse it, when he was near the bottom the peece of wood slipt out, fell downe upon him and killed him". But the most frequent sources of accident were

¹ *An Account of the Coal Mines near Whitehaven* (1801), 101.

² Vol. iii. 204.

failure to obtain a secure grasp of the rope, failure to retain a seat on the horse, and the upsetting of the bucket. The newspapers of colliery districts abound in the records of casualties from all these causes.¹

As shafts grew deeper, and the weight of the winding rope increased, it became impossible to raise the load of rope and coal with horse gins unless low gearing were adopted, and this meant low speed of winding and high costs. Progress therefore consisted in the discovery of new and more powerful agents to take the place of the gin horses. About the middle of the century Michael Menzies obtained a patent for the device of a descending bucket filled with water, and this was used at Chartershaugh Colliery on the Wear in 1753, and quickly spread to other coalfields. The "water-pulling machine" introduced at Thomas Fenton's Colliery in Yorkshire about 1760 was clearly a variant of the *menzie*. Over a large drum at the surface one end of the rope passed down the coal-pit and the other down the neighbouring water-pit. As the tub of water descended it drew up the laden corves, and when it reached the bottom a valve in the tub opened automatically and let out the water. The descent of the empty corves in the winding shaft drew the empty tub up the water-pit, and the water was pumped to the surface to be used again.²

The early steam-engine, as has been pointed out, was essentially a device for raising water, and its application to the winding of coal and other minerals was an exceedingly slow process. A first attempt was made by Joseph Oxley, who, in 1763, obtained his patent "for drawing coals by fire". His method was put into practice immediately at Hartley Colliery, in Northumberland; but although it was still in use there five years later when James Watt went to inspect it, the

¹ See, for example, *Sheffield Register*, February 22, 1793; *Sheffield Iris*, May 22, 1806; and Cutting in *Bell. Coll.* xx. 168.

² *V.C.H. Yorks.* ii. 357.

engine was hardly a success, for it had no fly-wheel and its action was very irregular. It was ultimately converted into a pumping engine to supply water to an overshot wheel by means of which the coal was raised. This combination of steam and water power was commonly employed in Scotland, in Northumberland and Durham, and in Warwickshire during the 'seventies and 'eighties in particular. It was brought to a high pitch of efficiency by Smeaton, who arranged that the speed of winding should be automatically reduced when the ascending and descending corves were passing each other, and also that the water supply should be cut off when the corves reached the top or bottom.¹ In Smeaton's apparatus reverse motion was obtained by changing the cog gear, the water-wheel continuing to revolve in the same direction as before; but other mill-wrights sometimes divided the rim of the wheel by a vertical partition so as to provide two sets of buckets arranged in such a manner that the movement of the wheel could be reversed by simply deflecting the stream from one set of buckets to the other. So effective was water-power that this method of winding persisted long after the problem of converting the reciprocating action of the steam-engine into rotary motion had been solved. In 1787 John Buddle recommended the Duke of Norfolk to make use of a fire-engine to drain his colliery, but to utilise a water-wheel for drawing coal;² and the water-wheel with double buckets continued in use at Whitehaven till as late as 1803.³

At an early stage in his career James Watt had attempted to produce a steam-wheel to work mills and machinery; but preoccupation with the Cornish mines and other matters delayed his giving attention to the invention of a rotary engine until 1779. By this time a common fire-engine belonging to James Pickard had

¹ N. W. Dickinson and Rhys Jenkins, *James Watt and the Steam Engine*, 254.

² *Norfolk MSS. Report on Sheffield Park and Attercliffe Collieries*, by John Buddle, April 7, 1787.

³ R. W. Moore, *loc. cit.* 630.

been fitted with a pawl-and-ratchet arrangement by Matthew Wasbrough of Bristol, who obtained a patent for the device in the same year. The engine did not work satisfactorily, and towards the end of the year 1780 the device was replaced by a connecting-rod and a crank. A second patent was taken out by Pickard, and shortly afterwards engines with cranks and fly-wheels were in use in various parts of the country. It is well known that Watt felt himself debarred by this patent from making use of the crank in his own engine, and the five alternative methods of producing rotary motion, which are the subject of his patent of 1782, were the result of this inhibition. Into the disputed question of whether Pickard obtained his idea from Watt by surreptitious and unfair means it is unnecessary to enter here:¹ suffice it to record that, by one contrivance or another, the steam-engine was able, from the early 'eighties, to produce rotary movement, and that it was therefore possible to apply it direct to the winding of coal.

Winding engines, or whimseys as they were usually called, were of a much smaller horse-power than pumping engines, and one made for Richard Reynolds & Co. in 1788 was actually mounted on a four-wheeled truck, so that it could be moved from one pit to another. Boulton and Watt supplied small engines for winding to John Wilkinson at Bradley in Staffordshire (1782 or 1783); to Messrs. Ord, Pearth & Co. of Walker Colliery, and Messrs. Surtees & Co. of Benwell Colliery near Newcastle (1794); and to Baglan Colliery in Glamorgan (1793). But rival engineers were quickly in the field: Robert Cameron, who had obtained a patent for a rotary engine in 1784, had put up five whimseys on the Tyne before 1789, and Adam Heslop, of Ketley, and Jabez Hornblower also built several engines in Northumberland and Cumberland.² By the expiration of

¹ For a critical discussion of this point see H. W. Dickinson and Rhys Jenkins, *James Watt and the Steam Engine* (1927), ch. xiii.

² *Ibid.* 168, 249, 307-8, 314-15.

Watt's patent in 1800, a considerable stimulus was given to engine construction throughout the country, and shortly afterwards Trevithick's high-pressure engine was adopted for drawing coal at many mines about Newcastle. In 1810 Farey counted more than fifty winding engines in the counties of Derby and Nottingham alone;¹ and though some of these were used at metal, as distinct from coal, mines, it is clear that by this time steam had superseded horses and water-wheels at most of the larger collieries in the Midlands, as well as in the north of England.

The steam-engine was not the only contribution made by James Watt to the technique of drawing coal. In the operation of winding, as one corf nears the bottom and the other the top of the shaft, the pulls on the axle are unequal by the difference between the weights of the two ropes and the loads attached to each. At shallow pits this was a matter of small moment, but at the deeper ones some method of equalising the strain was imperative. The most usual device consisted of a small drum, mounted on the same axle as the winding drum, and from this an old rope or chain was allowed to hang, either in the shaft itself or in a separate balance pit. Sometimes the counterpoise was obtained simply by regulating the winding and unwinding of the equalising rope: and sometimes the balance rope was furnished with weights, so arranged that at certain points in the winding they rested on stages and at other points they hung in the shaft and exerted a pull on the axle. Sometimes again a cast-iron chain rested on the pit bottom when the ascending and descending baskets met in the shaft. As the distance between them grew, the chain was wound up by a small rope, and the counterbalancing pull on the axle was thus gradually increased; on the other hand, when the baskets approached each other the rope was unwound, and, as the chain coiled on the floor of the pit, its pull on the axle was

¹ Farey, *op. cit.* i. 338.

gradually relaxed.¹ A substantial improvement was effected in 1784 when Watt devised a double spiral barrel, which was so arranged that the balance rope coiled on the narrow end of a cone when the winding ropes were of about the same length, but on the wider part of the cone as the difference between their lengths increased. A further advance was registered when, a few years later, the ropes were made to taper from a circumference of 7 inches at one end to that of 5 at the other; and in 1798 John Curr removed the necessity for a counterpoise altogether by his invention of the flat rope. This was made up of several small ropes of circular section stitched together: at the beginning of the operation of winding, the rope to which the loaded corves were attached wound on a small diameter; but as the corves were raised, and the rope coiled on itself, the diameter increased, while that from which the ropes bearing the descending empty corves unwound correspondingly diminished. The contrivance led to a substantial reduction in the time and cost of winding: Curr claimed that the speed of drawing coal was increased fivefold, and, according to his estimate, at the Duke of Norfolk's collieries in Sheffield the saving effected amounted to between £300 and £400 a year.²

II

In the small pits of the early years of the eighteenth century underground transport offered few problems to the colliery viewer. In Scotland and Cumberland, and probably in other parts of the country, the coal was carried to the pit bottom on the backs of men and women; and about the Tyne and Wear the barrowmen or putters dragged the laden corves on pieces of wood, furnished with runners of oak or ash to enable them to

¹ Dickinson and Rhys Jenkins, *op. cit.* 252.

² *Norfolk MSS. Report of Inventions introduced by John Curr*, October 23, 1801.

slip more readily over the uneven floors of the "gates". But as pits became deeper expense precluded the sinking of many shafts, and coal had to be drawn over considerable distances. The putters or drawers were almost invariably paid wages which varied with the distance they travelled;¹ and the high cost of putting by men and boys forced attention to the possibility of other means of locomotion. Sometime during the first half of the century ponies or galloways were introduced to draw the sledges in the larger collieries of the north of England. Writing of the Dyke Pit at Tanfield Moor Colliery in February 1749/50, John Watson observes, "Height of the coal is 4 ft. 4 ins. and they put the coal with poney Galloways"; and references to sledge-drivers in the miners' bonds of the 'sixties and 'seventies prove that the use of horses underground was by this time common. Whether the substitution of animals for men in this laborious work led to any substantial reduction in the human costs of the industry is doubtful; for whereas the barrowmen of the early half of the century were adults, or at least well-developed youths, the ponies could be driven by small boys, and a big extension of child labour seems to have occurred. The work was strenuous and the working-day long: when Jars visited Walker Colliery in 1765 the hewers normally worked only for six or seven hours a day; but the youthful fillers and drivers toiled for fourteen hours—from two o'clock in the morning till four in the afternoon. Obviously horses or ponies could be employed only where the underground ways were high; and at many collieries the coal was transferred to the horse-drawn sledges in the main gates by boys or youths, while, even in the nineteenth century, at some places the putters drew it all the way to the pit

¹ At Harrock Hill Colliery, in Lancashire, in 1730, the ordinary cost of drawing was 2½d. a score of 21 corves, but at 40 yards from the eye of the pit began "odd drawing". Between 40 and 56 yards the payment was increased by ½d.; thence to 72 yards by 1d.; thence to 80 by 1½d.; to 120 yards, 2d.; to 136, 2½d.; and so on till between 232 and 248 yards it was 6d. *Halliwel MS.* Communicated by Rev. T. C. Porteus.

bottom. In low seams the boys, moving forward on hands and knees, dragged the laden sledge by means of a girdle and chain, and this appliance, known as the *guss*, is still employed in Somerset in moving the coal from the face to the main roads.

Where the floor of the mine allowed of them, wheeled vehicles could be used in place of the sledges, and from early times the friction of the wheel on the road was reduced by the laying of planks in the more difficult places. In the single line of planks, along which the wheelbarrow was pushed, lay the germ of the railway: later a double line of planks was laid for the four-wheeled waggon, and a pin was made to project from the bottom of the waggon into the space between the rails, so as to prevent the waggon from leaving the track. Such simple railways were used above ground at an early date: they existed at the collieries of the Willoughbys, near Nottingham, as least as early as 1610; a few years later they were used in Shropshire; and before the opening of the eighteenth century they were found in South Wales and about the Tyne, where they were carried over elaborate bridges and embankments to the shipping points. Early in the seventeenth century railroads had probably been constructed along the horizontal drifts of the Shropshire coalfield, but it is doubtful whether they were extensively used for underground transport until the following century: in 1765 their presence at pits in the north of England attracted the attention of a foreign engineer.¹

Perhaps the most important step in the development of the railway was the substitution of metal for wooden rails. This, as is well known, was the achievement of Richard Reynolds, who, between 1768 and 1771, took up the wooden rails that had been laid in the 'fifties between Ketley and Coalbrookdale, and replaced them by plates of cast iron bearing an inner flange to keep

¹ *Hist. MSS. Comm., Middleton MSS., 177; V.C.H. Durham, 326; Granville Poole in Historical Review of Coal Mining.*

the wheels of the waggons in position. The substitution of rails of malleable iron for those of cast iron, made possible by the genius of Henry Cort, led to a rapid extension of railroads in the 'eighties and 'nineties; by 1813 over twenty miles of them had been laid in the underground ways at Whitehaven, and the colliery area of Northumberland and Durham soon became a vast reticulation of rails both above and below the surface.

In producing this result, and in the working out of the many problems to which this new form of transport gave rise, many engineers played their part, but among them the outstanding figure was John Curr, who for many years occupied the post of viewer to the Duke of Norfolk's collieries in Sheffield. Curr was born, and spent his early years, on the coalfield of Durham, but removed to Sheffield probably in the early seventeen-seventies. At this period Sheffield Park Colliery was let by the Earl of Surrey to Messrs. Townsend and Furniss, who disposed of the coal, according to the usual practice, by sale to the dealers and carters at the pit head. In 1774, however, as the result of an outcry against the high price of fuel, a plan was prepared to convey the coal from the pits to the town by "the Newcastle method", *i.e.* by a railroad; and this was laid down at a cost of £3280. Whether or not the project emanated from Curr is uncertain, but a few years later, when the colliery was taken over by the Earl of Surrey, Curr was acting as the manager of this and of all the other mining concerns of the Howard family. The most important of his innovations was the substitution for the baskets in which the coal was carried of small four-wheeled corves, which were pushed by boys along tramways in the underground passages. It has been questioned whether Curr actually made use of cast-iron rails below ground before 1790; but a report¹ made by John Buddle in March 1787 puts the matter beyond doubt; for a comparison of the costs of "the new scheme of hurrying the

¹ *Norfolk MSS.*

coals" with those of hurrying with horses includes "Expenses of Cast Iron Plates and Barrow-way". The cost of the old mode was put at 10½d. a waggon-load, that of the new at 6¾d., and it was estimated that the saving at this colliery amounted to £312:10s. a year.

There was nothing new in the use of four-wheeled vehicles underground: they had been employed at least a generation earlier in the Newcastle area to carry the wicker corves to the pit-bottom. Curr's innovation was the combination of waggon and corf, the making of a vessel that would run on wheels and could also be raised up the shaft. In Northumberland and Durham baskets were necessary because the bulk of the output was coal in relatively small pieces;¹ and though in the pits about Radstock, in Somerset, the coal was loaded directly into sledges with wicker or wooden sides, it was unloaded into baskets before winding.² The new wheeled corf obviated this second handling of the coal, and much bigger loads could be drawn by a horse than when the coal was contained in baskets.

To prevent collision between the ascending and descending corves, guides or conductors were devised and patented by Curr in 1788. Two pairs of wooden rails were set vertically upon opposite sides of the shaft, and the ends of a crossbar, to which the corf was attached, ran in the channel between them and so prevented oscillation. The laden corf was raised a little way above the surface, so that a wooden platform could be slid beneath it from which the corf could be run off to the coal stack.

A little later further improvements were made by Curr: the rails, which had previously consisted of cast-iron plates fixed on wooden rails, came to be made entirely of cast iron, and instead of the corf being held to the line by a flanged wheel the rails themselves were

¹ Curr, *The Coal Viewer* (1797), 8.

² Greenwell and M'Murtrie, *The Radstock Portion of the Somerset Coalfield*, 6.

flanged. Moreover, self-acting inclined planes were introduced both above and below ground, so that the full corves in descending "hurried up" the ascending empties; and a scheme of underground canals was worked out so that the coal could be carried, as at the Duke of Bridgewater's Worsley Colliery, in long, narrow barges from the working face to the pit bottom.¹ Finally, in 1805, Curr applied the steam-engine, for the first time, it is believed, to the purpose of underground haulage.

So many innovations soon brought the inventor into repute throughout the country: his wheeled corves came into use at many of the larger collieries; and he was consulted by several important concerns, including the Coalbrookdale Company.² Nevertheless, he did not wholly escape the traditional lot of the pioneer. Affairs at Sheffield were not flourishing during the last fifteen years of the century; and in 1787, and again in 1789, John Buddle was called in to report to Curr's employer on the state of the collieries. The report of 1787 was entirely favourable; and though two years later John Buddle and John Stephenson felt obliged to recommend the closing of Attercliffe Colliery, they added, "When we think of the Ingenuity and Judicious Application of several late Inventions there adopted . . . we feel ourselves hurt as Colliers, in giving a decision so very unfavourable".³ During the 'nineties irregularities in the seams of coal gave great trouble; about 1795 water from two abandoned collieries found its way into some of the Duke of Norfolk's pits; and severe competition was encountered from a colliery set up in 1793 by a number of sick-clubs of Sheffield.⁴ In 1801 John

¹ *Report of John Buddle to the Duke of Norfolk*, April 7, 1787. *Norfolk MSS.*

² *Letter of Curr to R. Dearman*, May 25, 1793. *Horsehay MSS.*

³ *Report of John Buddle and John Stephenson to Vincent Eyre, Esq., on Attercliffe Common Colliery*, April 24, 1789. *Norfolk MSS.*

⁴ *Letter of John Curr to the Duke of Norfolk*, October 23, 1801. *Norfolk MSS.* The industrial activities of friendly societies are exhibited also in the purchase, in November 1795, of a corn-mill. *Sheffield Register* (1830).

Curr was suddenly dismissed the service of the Duke, without any reason being offered him. In a long letter of protest he set forth the category of improvements which he had effected, and asserted that his own gains had been small. "Now sixteen out of twenty collieries have introduced this mode of conveying coals [he wrote of his tramways] in the Countys of York, Lancaster, Salop, Derby, Staffs., Warwick and a great part of Wales, and is now adopting near London and Newcastle-upon-Tyne, and those who live 10 or 15 Years will probably see my Rail Roads introduced all over this Kingdom, notwithstanding 12 years passed over before they were much imitated". His wheeled corves, his flat-rope winding, and his other contrivances, it was claimed, had been of considerable value to the Duke; and failure to make larger profits was the result of the inroads of water and the price-war with the opposition colliery—"Here my Ingenuity has been buried".¹

Fortunately for Curr, he had other sources of income than the £190 a year which constituted the salary of the viewer. He had royalties from his patents and profits from a foundry which he had set up in 1792 to make the cast-iron rails and boilers and other parts of the new rotative winding engines. An Account Book of 1805 shows that the Duke of Norfolk continued to buy castings and flat ropes of him, and his son seems to have found service at the Duke's collieries.

Whether or not Curr prospered, he and his predecessors in the development of the railway certainly deserved well of their fellows; for they did more than any philanthropist of their day to lighten the lot of the most heavily pressed grades of underground labour, the youthful putters and drivers.² Not only was the individual relieved, but the proportion of workers engaged

¹ *Norfolk MSS., Report of Inventions by John Curr*, October 23, 1801.

² The gratitude of a later generation broke out in verse:

God bless the man wi' peace and plenty,
That furst invented metal plates;

in this onerous branch of mining was substantially reduced. At the beginning of the eighteenth century far more labour was employed in moving, than in getting, the coal. At Bo'ness, in 1681, there were 37 bearers to 13 hewers, and at Dunmore, in 1769, 74 bearers to 28 hewers.¹ Even in Northumberland and Durham, where the crude system of bearing had long been given up, there were at Charlaw, in 1769, 10 barrowmen to 10 hewers; and at Stanley Kiphill Colliery the coal hewn by 70 pitmen required the services of 50 putters and 27 drivers to move it to the pit bottom.² But, as the direct result of the improvements in underground carriage, by the early years of the nineteenth century the hewers almost always outnumbered the drawers of coal: at Heaton Colliery, in 1806, there were 143 hewers to 84 putters; at Middleton (Yorks), in 1808, 90 hewers to 60 putters; at Washington, in 1813, 67 hewers to 40 putters; and at Gatherick, in 1823, 12 hewers to 6 putters.³ Such was the immediate result of the work of John Curr. The final result of his invention, like that of Sir Humphry Davy's, was unfortunately less satisfactory. For the wheeled corves could be moved by young children, and though at most places horses were retained to draw a train of corves along the main gates, in some Scottish pits boys were substituted for horses.⁴ Moreover, in most of the coalfields the boys and girls

Draw out his years te five times twenty,
Then slide him through the heevenly gates.

For if the human frame te spare
Frae toil an' pain ayont conceevin',
Ha'e aught te de wi' gettin' there,
Aw think he mun gan strite te heeven.

From THOMAS WILSON, *The Pitman's Pay*.

¹ Barrowman, *loc cit.* 274-5.

² Charlaw Bond in App. B; Bulman and Redmayne, *Colliery Working and Management*, 40.

³ MSS. in Bell and Watson Collections, Newcastle; Kenneth Vickers, *History of Northumberland*, xi. 426.

⁴ "It was when the iron railways came in that they were putting away the horses and brought boys in to draw". *Rept. of Child. Empl. Comm.* (1842), 363, ev. Geo. Lindsay.

who dragged or pushed the wheeled corves from the working places to the underground railways in the main roads were of more tender years than their predecessors who dragged the sledges.

That the public railway of the nineteenth century was the immediate descendant of the colliery tramway of the eighteenth requires no long argument: it is attested by the length of the axle of modern rolling-stock, for the standard gauge of to-day is the distance between the wheels of the coal waggons used in the North 150 years ago. But it is not only the permanent way with its rails that derives from this source: the other essential constituent of the modern railroad, the locomotive, is also very largely a product of the coal industry. It was on the coalfields of South Wales and the Tyne that Trevithick's first attempts at steam locomotion were made, and most of his successors had close personal associations with coal-mining: Blenkinsop was viewer to Charles Brandling at Middleton Colliery, near Leeds; Hedley was viewer to Mr. Blackett at Wylam; and George Stephenson was engineer to Sir Thomas Liddell's colliery at Killingworth. But the story of these inventors, and the transformation they effected, not only in the coal industry but in the economic structure of Britain, demands a broader canvas and a wider sweep of the brush than are at the disposal of the writers of a monograph.¹

¹ Reference to Dr. Clapham's *Economic History of Modern Britain: The Early Railway Age*, is, we hope, superfluous.

CHAPTER V

THE SCOTTISH COLLIER-SERF

Will he make a covenant with thee,
That thou shouldest take him for a servant for ever?
JOB xli. 4 (R.V.)

COAL-MINERS have always been a race apart, with mentality and aspirations unlike those of the rest of the working class. This spiritual isolation is largely a reflection of physical isolation. Living remote from the quick life of the town, the collier has developed speech and habits that effectively cut him off from his fellows. If this is so in an age of developed communications when industries are largely concentrated about the coal-fields, how wide must have been the gulf in earlier centuries when the collieries were sometimes several days' journey from the centres of urban life.

This geographical isolation had an intimate effect on the relations between employer and employed. The proprietor or lessee of a coal-mine was usually dependent on local supplies of labour: if his workers left him they could not easily be replaced, and even a temporary stoppage might destroy the capital sunk over long years in the colliery. To safeguard against such loss the owner often sought to bind the worker under a long-period contract, with penalties more or less drastic for breaches of the engagement, and labour was thus rendered immobile.

This bond system, as might be expected, was seen most fully developed in the more remote coalfields. In Scotland it took the form of lifelong servitude, and the status of the worker has been described—not rhetorically but in the sober preamble to an Act of Parliament¹

¹ 15 Geo. III. c. 28.

—as one of slavery. Whether this slavery was a survival of the agrarian serfdom of the Middle Ages, or whether it was entirely the result of legislation cannot be discussed here.¹ It must suffice to point out that legislation certainly played some part in the making of the collier-serf. The Scottish Poor Laws of 1579 and 1597 had given the vagrant who had been sentenced the option of servitude to anyone who would undertake to keep him in employment; and his children might also be seized and kept in lifelong bondage. It is hardly likely that sturdy beggars would be regarded as desirable recruits for manufacturing establishments, but it is quite possible that they would be acceptable for the rougher work of coal-mining.² And an Act of 1672 specifically conferred on coal-masters the right of apprehending vagabonds and their children without the necessity of any trial in a court of law.³

More important, however, for the regular worker were the measures designed to check the movement of labour. In the early seventeenth century the Scottish coal-mines were closely connected with the salt-pans, which they supplied with fuel, and as both industries expanded, the employers became conscious of a shortage of labour. The attempt of new-comers to attract workers from the older collieries and salt-works was probably the immediate cause of the Act of 1606, the first clause of which lays down that

“Na persone within this realme heirefter sall fie hyre or conduce ony saltaris Coilyearis or coilberaris without ane sufficient testimoniall of thair Maister quhome they Last servit subscryuit with his hand or at leist sufficient attestatioun of ane ressonable cause of thair removeing

¹ According to Lecky it was a survival. But Cosmo Innes insists that agrarian serfdom disappeared in Scotland, first of all European countries, as early as the fourteenth century. *Sketches of Scottish History* (1861), 499, and *Trans. Inst. Min. Engrs.* xiv. 278. Inquiries into the status of Scottish colliers before 1606 give conflicting results. See *Edinburgh Review*, No. 189, 122, and Galloway, *op. cit.* 76n.

² *Edin. Rev.*, *loc. cit.* 125.

³ *Acts of the Parliaments of Scotland*, viii. 916.

maid in pñs of ane baillie or magistrat of the pairt quhair they come fra".¹

If workers were engaged without such a testimonial they could be reclaimed by their former master within a year and a day of leaving him, and punished as thieves; and if the new employer refused to surrender them within twenty-four hours he was liable to a penalty of £100 Scots. The specifying of saltworkers, colliers, and bearers was evidently taken to imply exemption for other classes of labour that were already beginning to appear at collieries; but when, in 1641, the Act of 1606 was ratified it was extended to cover the watermen, windsmen, and gatesmen, who were not colliers in the narrow sense of the term. At the same time it was enacted that since the giving of large fees on hiring was a means of seducing colliers from their employers, no master should offer as earnest a sum greater than 20 merks.²

Somewhat similar, but less drastic, measures were passed in the interests of employers in other industries. In 1641 a leaving certificate was made the condition of removing from certain manufactures; and three years later an act, ostensibly designed to prevent evasion of military service, forbade all hired servants to leave their masters without a written consent. It is unlikely that this widely applicable enactment was strictly enforced; but possibly because of his more dependent condition, of his isolation, or of his employment by men who controlled legislation and administration, the collier found himself more strictly confined by legal fetters than were the workers in other trades. By simply withholding a testimonial a master could bind the collier for life, and the only remedy for the worker was to escape to England for a year and a day, or to find employment in Scotland with some master who was willing to risk the penalties which the law laid down. But employment with the new master for a year and a day bound the

¹ *Acts of the Parliaments of Scotland*, iv. 287.

² *Ibid.* v. 508.

collier to him as firmly as to the old employer: one yoke had simply been exchanged for another. And during the year and the day he was liable at any time to be sought out and hauled back to the pit from which he had escaped.

A decision of 1708 under which Sir Thomas Wallace of Craigie sued William Cunningham of Brownhill for the return of eight or nine colliers shows how very long was the arm of the law where runaway workmen were concerned. Notwithstanding that it was seven or eight years since the men had left his service, Wallace was allowed to recover them on the ground that they had been given no leaving certificate and that they had been at work with Cunningham less than a year and a day.¹

The respective rights over labour of coal-owner and lessee had also to be determined by the courts. In 1739 James Scott took a lease of coal-pits at Rutherglen which he worked for sixteen years, at the end of which he removed the colliers to another estate. Some years later, when the owner of Rutherglen decided to work the colliery himself, he succeeded in establishing his claim to the colliers on the plea that they were bound not to the lessee but to the coal.² During the currency of the lease the tacksman (or lessee) had the power to apprehend and bring back workers who had deserted, and this was sometimes explicitly assigned to him in the lease. But at the end of the term the right to the colliers evidently reverted to the owner, even, it would appear, though the tacksman might have given testimonials to the colliers for whose services he had no longer any use. This was clearly stated by an aged witness to the Children's Employment Commissioners in 1841:

"Father and grandfather [he said] were slaves to the Laird of Preston Grange, and after the works had stopped and we got licence from Mr. Peter Hunter,

¹ J. Barrowman, "Slavery in the Coal-mines of Scotland", *Trans. Fed. Inst. Min. Engrs.* xiv. 270.

² *Ibid.* 271, 274.

the then tacksman, we could not get work, as the neighbours kenned that the Laird of Preston Grange would send the sheriff after us and bring us back.”¹

Service for a year and a day was not the only method of binding. A man might enslave himself immediately by entering into an agreement with an employer and accepting “arles” as a token of engagement. These arles might take the form of money, or, as at Prestongrange, of a commodity such as a pair of shoes. The practice of “arling”, moreover, was used to ensure that the children of a collier would follow their father’s occupation, and become, like him, the bond-servants of the mine-owner. A gift made to the parents at the baptism of a child was assumed to imply an undertaking to bring up the child as a collier; and though the legal validity of such arling is doubtful, sanctioned as it seemed to be by the presence of the minister at the christening, it was usually effective in binding the child for life.² For unless the child established a claim to liberty within a year and a day of his coming of age, he automatically became a serf as his father before him.³

In practice serfdom was hereditary, and whole families were regarded as attached to a colliery estate: in inventories and offers of sale their value was included, just as was the value of the gin horses or the stock of punch wood at the pit head. Generally the wife of the collier, as already pointed out, acted as his bearer, and both sons and daughters might also help in the work. If the children had become bound to the colliery the father was “cautioner”, that is, he was held responsible for their good conduct, and if they ran away he could be called

¹ *Children’s Employment Commission (1842), Appendix to First Report (Mines)*, 451.

² *Edinburgh Review*, *loc. cit.* 120.

³ “With a few rigid exceptions the condition of the head of the family was the condition of the whole house. For though a child, if *never* entered with the work, was free, yet entering was its natural and almost certain destination; for its doing so was valuable to its father, and its getting into any other employment in the neighbourhood was restricted by the owner” (from Lord Cockburn’s *Memorials*, cited Innes, *op. cit.* 502).

upon to pay the expenses of recovering them.¹ But if a collier had no wife or other relative he might obtain the services of some unattached person to act as bearer for him, and, in this case, he would have to act as cautioner.² Such bearers as were not of the collier's household were known as fremd or fremit bearers; and like the house bearers, they were usually women. Never, apparently, did they form a large proportion of the staff of a colliery, for their lot was so unspeakably arduous, and their status so low, that few would accept the service. At a colliery at Bo'ness in 1681 the 13 hewers were assisted by 26 house bearers, of whom 5 were males, and by 11 fremd bearers, of whom only one was a male; and at Dunmore Colliery in 1769 there were 28 colliers, 23 bearing wives, 17 bearing sons, 29 bearing daughters, and only 5 fremd bearers—obviously to move the coal for the five hewers who had no bearing wives of their own.³

It has sometimes been suggested that only by an illegitimate extension of its import can the word "slave" be used as a description of the Scottish colliers. In some respects, it is true, their status was superior to that of the workers on a West Indian plantation, or even to that of the agrarian serfs of the Middle Ages. "They have indeed", said Adam Smith,⁴ "privileges which slaves have not. Their property after maintenance is their own, they cannot be sold, but along with the work, they enjoy marriage and religion". Further, they were paid wages, and, in some instances, very high wages; and in at least one locality they established their claim to vote as burgesses.⁵ In addition to the money handed over to them they received gifts from their masters that must have counted for much in their economy. At Shotts (Lanarkshire) in 1773 a collier was allowed two pecks of meal a week when sick; when he married his master gave

¹ For an instance in 1778 see S. Cunningham, *Mining in Mid and East Lothian*, 29.

² For an agreement to act as cautioner for a female fremd bearer in 1772, see Cunningham, *op. cit.* 38.

³ Barrowman, *loc. cit.* 274-5.

⁴ *Lectures* (ed. Cannan), p. 99.

⁵ Barrowman, *loc. cit.* 270.

him a present in money, and materials to make a bed; and when he died deals were provided for his coffin.¹

Nevertheless, the legal and social status of the colliers was low. They were expressly excluded from the scope of the Scottish Habeas Corpus Act² of 1701; and the fact that criminals were occasionally sentenced to the coal-mines for life implies that the industry was not regarded as a channel for the activities of free men. Workers in other industries refused to marry the daughters of colliers. And the cleavage from the rest of the community was not closed even by death, for in Fifeshire the collier was not allowed a grave in ground alongside the free.³ It would not be easy to find in any other industry a picture so dark as that drawn by another old collier in 1841:

"Was first yoked to the coal work at Preston Grange when I was nine years of age: we were then all slaves to the Preston Grange laird.

"Even if we had no work on the colliery in my father's time we could seek none other without a written licence and agreement to return. Even then the laird or the tacksman selected our place of work, and if we did not do his bidding we were placed by the necks in iron collars, called jugs, and fastened to the wall or 'made to go the rown'. The latter I recollect well, the men's hands were tied in face of the horse at the gin, and made run round backwards all day".⁴

The depressed condition of the colliers was not only reflected in their own habits and amusements, it had stamped itself upon the carriage and features of their women-folk, who, often the slaves of slaves, bore the heaviest burden of all. It was not only their bent backs that told of their despised calling: their very faces proclaimed their servility. "They were marked by a peculiar type of mouth, from which I learned to distinguish

¹ Graham, *Social Life of Scotland in the Eighteenth Century*, 532n.

² *Acts of Parliaments of Scotland*, x. 274.

³ *Edinburgh Review*, loc. cit. 138.

⁴ *Children's Employment Commission* (1842), *Mines*, 408.

them from all the other females of the country", said a contemporary.¹ "It was wide, open, thick-lipped, projecting equally above and below. . . . It was accompanied with traits of almost infantile weakness".

At no time, probably, was the whole mining population of Scotland enslaved. For slavery implies absence of mobility, and there is evidence that in Scotland, as in England, there was much coming and going among the colliers. That the number who retained their freedom by frequent changes of master was no small one is suggested by the fact that in 1647 it was thought necessary to pass an act altering the time of the collier's hiring from Yule to December 1, on the ground that the custom of flitting and entering at Yule was associated with boisterous celebrations and superstitious observance.² Moreover, in the eighteenth century entrants to the industry sometimes stipulated that they should not become serfs as the result of their employment; and in at least one instance, in 1743, an employer in need of labour offered any collier who would engage with him the right to leave his service at a week's notice.³ It seems possible that some undertakings employed alongside their serfs a number of free colliers who were more or less casual workers, and the frequency of the complaints against runaway serfs implies that it was not difficult for the collier to find new employment.

If the facts of mobility seem to disprove universal serfdom, so also do those of remuneration. The exact wages received by the Scottish colliers cannot, indeed, be stated with precision, for there is much conflict of evidence. In 1715 coal-miners in the East of Scotland received, perhaps, in sterling, 1s. 2d. a day, and about the same time the hewers at Saltcoats got 1s. 8d. a day, or 8s. 4d. for a five-day week.⁴ In 1744, however,

¹ Hugh Miller, quoted Cosmo Innes, *op. cit.* 500.

² Cochran-Patrick, *Early Records relating to Mining in Scotland*, li.; *Acts of the Parliaments of Scotland*, vi. 761.

³ *Edinburgh Review*, *loc. cit.* 142.

⁴ M. N. Scott in *Scott. Hist. Rev.* xix. 92.

hewers employed by the Lothian Coal Co. made only about 7s. a week, and out of this they had to pay 1s. 7½d. to a bearer.¹ According to Adam Smith,² in 1763 the Scottish collier received 2s. 6d. a day; and according to another professor, in 1771 the weekly wage was 13s. in Midlothian, Linlithgow, Stirling, and Ayr, and 12s. in Fife.³ On the other hand, a recent writer has shown that in 1770 the wages of a number of Whitehill colliers did not exceed 6s. or 6s. 6d. a week.⁴

For our present purpose it is unnecessary to discuss the wide variations in these figures: it suffices to point out that even the lowest of them exceeds the 4s. to 6s. a week which was the general rate of free day-labourers in 1771;⁵ while the highest of them is compatible with Adam Smith's statement⁶ that "a collier working by the piece is supposed . . . to earn . . . in many parts of Scotland about three times the wages of common labour". If the colliers had been truly slaves there would have been no necessity to pay them more than subsistence wages; and that they were given substantially more than other grades of labour is an indication that it was necessary to overcome by a bribe the natural reluctance of free men to enter an industry which involved so many social disabilities. The whole subject is, however, obscure, and further research is called for before safe judgment can be passed.

The emancipation of the Scottish collier is to be regarded as the joint product of forces partly economic, partly humanitarian. The generalisation of a distinguished French scholar⁷ as to the incompatibility of slavery with capitalism is only an elaboration of Adam Smith's famous dictum that "the work done by slaves . . . is in the end the dearest of all"; and though the

¹ Cunningham, *op. cit.* 38.

² *Lectures* (ed. Cannan), 99.

³ John Miller, *Origin of Ranks* (4th edit. 1806), 278.

⁴ Cunningham, *op. cit.* 29.

⁵ Miller, *loc. cit.*

⁶ *Wealth of Nations*, Bk. i. ch. x.

⁷ Henry Sée, *Les Origines du capitalisme moderne*, 177.

first act of emancipation was passed before the *Wealth of Nations* was in print, the ideas which the book was to popularise were already in the air. The rapid increase in the demand for coal, occasioned largely by the growth of the new ironworks—of which Carron, founded in 1760, was the first—required the employment of more workers in the Scottish coal-mines. It was clear to many coal-owners that the only way of inducing more labour to enter the industry was to remove the rock of offence which serfdom presented. And the fact that the initiative came from the masters, and was not associated with any public campaign, or with the personal career of any politician, has led to the assertion that “the Scottish colliers were emancipated in the same great cause they were enslaved in—the cause of low wages”.¹

This, however, is but a half-truth: it can hardly be altogether fortuitous that emancipation in Scotland should have come within two years of the Somerset judgment of Lord Mansfield against negro slavery. And though the reasons given in preambles to Acts of Parliament are not always those that sway the minds of the legislators, we have no cause to doubt the sincerity of those who, after urging that the Act would increase the number of colliers, added that it “would remove the reproach of allowing such a state of servitude to exist in a free country”.

The Emancipation Bill was introduced in March 1774 by the Lord Advocate of Scotland, Sir Alexander Gilmour; and though several proprietors of coal-mines petitioned against it, the support of the Earl of Abercorn and other powerful figures in the industry ensured for it an easy passage. On May 5, 1774, it received the Royal assent. The Act² declared that after July 1, 1775, no person entering the industry should be bound “in any other way or manner different from what is permitted by the Law of Scotland with regard to Servants and Labourers”. Colliers and salters already

¹ *Edinburgh Review*, *loc. cit.* 144.

² 15 Geo. III., c. 28.

in employment were to be freed by stages. Youths under 21 years of age were to obtain their freedom in seven years; men between 21 and 35 in ten years; those between 35 and 45 in seven years, "after their having respectively found and instructed a Person as an Apprentice if required so to do by the Master or Lessee"; and men over 45 in three years' time. When a miner or salter became free his wife and children became free also; and emancipation carried with it exemption from the disqualifying clause of the Habeas Corpus Act of 1701. The servitude of any worker might be extended by two years as a penalty for unlawful combination to raise wages, and men whose emancipation was dependent upon the training of an apprentice might be required to serve as bondsmen for a further three years, if they failed to comply with the condition.

The great defect of the Act was that under it freedom did not come automatically: a man was obliged to institute proceedings in a Sheriff Court in order to obtain it; and it is likely that many lacked the means or the initiative to do this. Sir Walter Scott, indeed, implies that the Scottish serfs had grown to love their bonds, and that they were wanting in gratitude to those who had brought them liberty.¹ But this was certainly not true universally. In 1778, when the first age-group of colliers was freed, some fifty of them marched with flying colours to Lord Abercorn's house at Duddingston to return thanks; and more than sixty years later a collier at Sir John Hope's pit at Pinkie declared that the anniversary of the first emancipation was always kept as a holiday.²

Between 1775 and the end of the century many

¹ "They were so far from desiring or prizing the blessing conferred on them, that they esteemed the interest taken in their freedom to be a mere decree on the part of their proprietors to get rid of what they called head and harigald money, payable to them when a female of their number, by bearing a child, made an addition to the live stock of their master's property". (*Redgauntlet*, Note x.)

² *Children's Employment Commission* (1842), *Appendix: Mines*, 451.

colliers remained unemancipated, some because of the postponing clauses in the Act, others because they failed to establish their claim in the Sheriff Court. Others again who had obtained nominal freedom continued to suffer many of the realities of slavery, for under the prevailing methods of wage-payment it was almost impossible for the worker to feel himself a free man. For many generations it had been customary for the worker to receive part of his earnings in the form of a bounty at the beginning of the year. An Act of 1641, it is true, sought to prevent the use of such bounties as bribes to seduce workers from their employers, by limiting them to 20 merks.¹ But during the later part of the eighteenth century this Act had clearly fallen into abeyance, and often as much as one-eighth, or even a quarter, of the total wages was paid in this way.² The worker thus entered upon his career at a colliery in debt to his employer, and, especially where the truck system had taken root, it was exceedingly difficult for him to extricate himself from his indebtedness. So long, however, as it continued he could not leave the colliery unless he could find a new employer to repay his debt. That this economic servitude was widespread is attested by a pamphleteer of 1793, who mentions it as one of the causes of "the present scarcity, and irregular, mutinous, and disorderly conduct" of the Scottish collier;³ and the Act of 1799 expressly refers to the practice of advancing sums of money in excess of what the colliers could repay, with the object of tempting them to continue their engagements. Moreover, the practice of arling, whereby the future labour of the child was mortgaged to meet the present needs of the parents, evidently continued unchecked; and, though no entrant to the industry was now

¹ *Acts of the Parliaments of Scotland*, v. 509.

² Barrowman, *op. cit.* 273.

³ *Description of the Estates belonging to the Earl of Dundonald at Culross* (1793), 68.

legally a serf, many of the disabilities of serfdom still persisted.

In April 1799—again, be it observed, a time when the Slave Trade was under discussion in Parliament—Sir Henry Dundas, the Lord Advocate for Scotland, introduced a Bill to amend the Act of 1774. Both coal-owners and colliers petitioned against it¹—the latter against some restrictive clauses that were at first included, but were afterwards removed as the result of the case presented by a lawyer, fee'd by some 600 Lanarkshire colliers who had raised 2s. a head for the purpose. It became an Act on June 6, 1799, and on this date the last shreds of legal slavery fell from the Scottish coal-miner.² It enacted that all colliers who remained bound because they had failed to obtain a decree of the Sheriff Court should henceforth be free, and that no action by coal-masters for the recovery of sums advanced to colliers should be competent, though an amount not exceeding one-twelfth of such sums might be kept back from wages each week till the whole was reclaimed. That a desire to increase the number of colliers was one of the motives of this Act, no less than of that of 1774, is proved by the inclusion of clauses imposing penalties on the seduction of colliers to foreign countries, as well as on unlawful combinations among the colliers themselves.

In this respect the measure failed to fulfil expectations. So deep was the stigma on the occupation of coal-getting that eight years after the Act had passed, far from labour having flocked into the industry, colliers had taken advantage of their new-found freedom to get out of it. Many, said Bald, had betaken themselves to the work of common labourers at half their previous wages. And though labourers and mechanics from other occupations had taken to many of the supplementary tasks about the coal-works, they "would spurn the idea of being a collier even at double wages". As late as 1827

¹ *J.H.C.* liv. 471.

² 38 Geo. III. c. 56.

it was necessary for the coal-owners of the Lothians to adopt extraordinary measures to maintain the supply of colliers.¹ For, for injuries such as society had inflicted on the Scottish miners, the working-class memory is a long one.

¹ H. G. Graves in *Trans. Inst. Min. Engrs.* xiv. 188. For similar legislation in France in 1753 see Rouff, *op. cit.* 292.

CHAPTER VI

THE MINERS' BOND IN THE NORTH OF ENGLAND

Lay down now, put me in a surety with thee.

JOB xvii. 3 (A.V.).

IN other parts of the British Isles there was no such anachronism as the bondage of the Scottish colliers. In Ireland, it is true, an Act of 1751 directed against the enticing of workers from their employment must have restricted the movement of labour, as must also one of 1761 which imposed a penalty of two months' imprisonment on absentees from coal-mines.¹ But neither here nor in England is there evidence of anything that could fairly be described as serfdom. In Scotland, after the emancipation, a yearly engagement was customary, and throughout the eighteenth century twelve months was the most usual period of the wages contract in the principal coalfields of England and Wales.¹

The reasons for such a term of hiring are not far to seek. With a shorter one the owner might frequently have found himself without labour and his pits falling to ruin, and in times of poor demand for coal the worker might have been left without means of subsistence, for there were few opportunities of other work in the typical colliery village. Moreover, it was natural for the land-owning coal-masters to apply to the underground workers the same rules of hiring as were associated with agricultural employment; and the desire for a "settlement", which, under eighteenth-century Poor Law practice, was conferred by a year's employment in a parish, would cause the workers to look on this period of

¹ *Rept. Children's Empl. Comm.* (1842), 115, 390.

engagement with particular favour. Finally, in a century when the years of war were nearly as many as those of peace, the immunity from the attentions of the military authorities which came to men bound under long agreements with their employers must have been no small consideration. At Sir Humphry Mackworth's colliery at Neath, in Glamorgan, it seems, indeed, to have been a principal reason for the system:

"It has been and still is, the Practice of *Sir Humphry Mackworth* [wrote his opponent, Sir Edward Mansel] . . . to receive and entertain at his Mine Adventurers, this Works, Strangers, and Idle Persons, without Certificates or Testimonials of their last legal Settlements. He has been desired to give security to save the Parish harmless from these men, which he has often promis'd to do, but never has done it: And to evade the Acts of Parliament in that case made, and also the Recruit Act, it is contriv'd, That when persons come into the said work, they sign certain Bonds, or Instruments, which they are told are only to serve for a colour to keep them in the Parish, and from being taken into His Majesty's Service".¹

In the north of England there is abundant evidence of long-term agreements. In February 1636/7, for example, four Wigan colliers bound themselves to dig for twelve months in the Bishop of Chester's pits at Farnworth, and, as earnest of the compact, each received the sum of half-a-crown.² Again in 1676 another Lancashire miner undertook that he would "well and truly serve for a year in the coal mines at Hulton or Denton

¹ *The Case of John Morgan* (1704/5), cited D. R. Phillips, *History of the Vale of Neath*, 236n. More than a century later a parish in South Wales was "kept harmless" from the colliers and ironworkers under an agreement of July 11, 1817 [*Ebbw Vale MSS.*], whereby the masters were excused payment of Poor Rate in return for their taking upon themselves the "expenses of paupers that are not parishioners and may actually become chargeable to the said parish of Aberstruth from the 1st day of July, through or owing to the said Ebbw Vale, Nantyglo Works, or Mr. B. Price's collieries". Two of the concerns also agreed to contribute towards the Militia Ballot, but Messrs. Harford Croker & Co., of Ebbw Vale, objected on grounds of religion.

² *Trans. Lancs. and Ches. Antiq. Soc.* vii. 61.

according to the customs and orders there used or to forfeit £40 sterling".¹

On July 24, 1750, the sum of 2s. was paid as earnest "for hiring Henry Bramwell for two years as a Drawer" at Sir Roger Bradshaigh's pits at Haigh;² and throughout the books of this colliery there are many references to payments made on the engaging of colliers and cannellers. An example of an annual hiring in another part of the county is afforded by an entry of October 23, 1767, in the books of the Duke of Bridgewater,³ relating to the engagement of miners to serve till November 8, 1768; and during the 'seventies numerous payments were made for expenses involved in recovering men who had absconded during the period of their bonds. For example:

1771 Mar. 1. By p ^d Thomas Speakman and John Walker			
Bill of Expenses in 1769 and Dec ^r 1770 seeking Col-	£	s.	d.
liers who had deserted from ye Works	4	1	4
1771 Mar. 4. By paid Robert Crippen a Bill of Petty Dis-			
burse ^{ts} on fetching Back Colliers Dec ^r last that had de-			
serted the Works	1	9	6
By paid Robert Crippen another Bill of Petty Dis-			
bursements viz ^t Money pd. to Colliers on Hiring and			
Ale etc. for Colliers from Dixon Green	1	8	10

At the Duke's collieries the most common time of hiring appears to have been the beginning of the winter, in November; and at Sir Roger Bradshaigh's pits October was the usual month of binding. At neither did the premiums reach such figures as were recorded on the Tyne in the early nineteenth century, but in 1787 six colliers at Gilbert Close Pit, Haigh, were given as much as half-a-guinea each.⁴

In Lancashire there were frequent variations from the normal twelve-monthly agreement. The depositions

¹ *Hist. MSS. Comm.*, 12th Rept., App. ix. 178.

² *William Porter's Day Book*, 1744-55 (*Haigh MSS.*).

³ *William Brough's Day Book*, 1766-68 (*Bridgewater MSS.*).

⁴ *Particulars of Colliers' Wages and Disbursements*, No. 4, 1787 (*Haigh MSS.*).

of witnesses in an Exchequer case of 1689, relating to Clifton, show that one man had worked at coal-getting for a fortnight only, and another for thirty weeks.¹ Although, as has been seen, the Duke of Bridgewater usually engaged men for the year, his practice varied and they were sometimes taken on for a shorter period; for on February 23, 1771, his agents paid 76 "Miners Handicrafts and Labour" sixpence each on their undertaking not to desert his service without giving six months' notice.² Again, at Haigh there is evidence that a hiring for eleven months sometimes took the place of the engagement for a full year:³

1787 Feb. 3. By 46 Canellers who sign'd a Agreement and en-	£	s.
gaged themselves for 11 Months at 1s. 6d. each . . .	3	9

In this instance the reason for the shorter period was perhaps the reluctance of an employer, who was also a large ratepayer, to allow outsiders to obtain a settlement in the parish. An eleven-months bond is said to have been common in Lancashire at this period,⁴ and evidence of its existence in Northumberland and Durham will be given below. Although the Ebbw Vale Company, in Glamorgan, usually engaged labour by the year, on December 27, 1799, a master-collier made an agreement for six months only.⁵ And in Yorkshire there is evidence of similar variation. At Bowling, in 1797, the sum of £5 was paid to each collier who hired himself for a full year, and in 1803 a guinea was paid on hiring for the same term.⁶ But in 1791 the colliers at the Brandlings' pits at Middleton in the same county were articulated for a period of three months only.⁷

It is, however, in Northumberland and Durham that the long-period hiring was most common, and it is

¹ *Trans. Lancs. and Ches. Antiq. Soc.* vii. 64.

² *Matthew Shelvocke's Day Book*, No. 2.

³ Loose sheet in *Haigh MSS.*

⁴ *Hist. Rev. of Coal Mining.*

⁵ *Ebbw Vale MSS.*

⁶ Cudworth, *History of Bolton and Bowling*, 238-9.

⁷ Twenty-seven of them were committed to the House of Correction at Wakefield for breaking their agreement (*Sheffield Advertiser*, December 30, 1797).

possible here to trace the broad lines of the evolution of the yearly bond. Some of the early agreements were simply gain-sharing arrangements between the pitmen and their employers, as that of October 3, 1706, whereby seven hewers of Sir Francis Blake's Gatherick Colliery agreed to give their master one out of every four "bowls" of coal got, the men binding themselves in a penalty of £20 to work five full days each week till the following Easter, and undertaking to supply three corves of small coals for the use of their master's mill.¹

The loose and almost mediaeval relations exhibited in this bond had already been far outgrown elsewhere. As early as 1703 a bond made between the hewers of Benwell and the High Sheriff of Durham established a definite rate of payment in money for each score of corves worked, an additional price for forward progress, and a special recompense for work of exceptional difficulty.² As time went on the number and complexity of the clauses in the bond were greatly increased. On the one hand, the workers sought to safeguard their standards by obtaining regularity of work and pay; on the other, the employers sought a guarantee of quantity and quality of output, and an undertaking on the part of the colliers not to combine against them.

These requirements of the employers are set forth in detail in a document³ signed by 110 hewers and 55 drivers at Pontop Pike and other collieries on October 22, 1763. The men engage not to combine, strike, or absent themselves from work; they agree to present one corf gratis every fortnight to the employer; they assent to a fine of one shilling for every corf sent to bank insufficiently filled; and they undertake to replace every corf rejected because of intermixture of stone with the coal. The hiring money is sixpence a man, and each

¹ Bulman and Redmayne, *op. cit.* 33.

² Welbourne, *The Miners' Unions of Northumberland and Durham*, 13.

³ *Trans. N. of Eng. Inst. Min. Engrs.* xv. 206.

collier binds himself to keep his contract or forfeit the sum of £18.

Sixpence or a shilling had long been the customary binding fee.¹ But during the period of high prices and temporary good trade that followed the conclusion of the Seven Years' War there was an acute shortage of pitmen on the Tyne and Wear, and one or two employers offered as much as three or four guineas as an inducement to hire with them. The great body of coal-owners, however, had long been accustomed to concerted action for other ends, and it was but natural that they should use their organisation to prevent a general increase in the bounties. An agreement was made that no employer should take on any man who was unable to produce a certificate of leave from the master whom he had last served; and since, in the prevailing shortage of labour, no employer would be willing to give any such certificate to a competent pitman, the effect would have been a binding during the will of the master, as in Scotland—"a species of slavery not to be endured in a free country".²

This action was the prime cause of the trouble that broke out in the autumn of 1765; but it was not the only cause. The owners had for long avoided hiring all their workers at the same time lest a general refusal to renew the bonds should bring the industry to a standstill. Nevertheless, there had been a tendency to engage the majority about the beginning of September so as to ensure a sufficient supply of labour to meet the demand of the winter season. Since, for reasons connected with "settlement", the period of binding was just short of a year (11½ months in some instances, 11 months and 25 days in others) the bonds of a large number of men were due to lapse about August 24 or 25, and those of others a week or two later. This year, however, the owners sought to force the colliers to defer their annual holiday to November 11—that is, to continue

¹ *Gentleman's Magazine* (1765), 430.

² *Annual Register* (1765), 130.

to work under their old bonds for a further period of something over two months.¹

The result was what might have been anticipated: on August 14 practically the whole of the miners in the North-Eastern Coalfield ceased work, and the trade of the ports was paralysed. At Newcastle and Sunderland over 600 ships lay idle; the keelmen were almost entirely unemployed; and, including those normally engaged in carrying the coal to London and distributing it there, it was estimated that about 100,000 men were "out of bread". After a fortnight the harassed employers were willing to give way on the fundamental issue; and on August 31 a broadsheet was issued appealing to the men to return to work until the expiration of their bonds, when all who wished for it should receive a written discharge. "No agreement", it was added, "is entered into by the Gentlemen of the Coal Trade, to refuse employing any Pitman, on account of his having served in any other Colliery the Year before".²

By this time, however, passions had been roused, and the men had associated their protest against the employers' action with a demand for increased wages and the cancellation of the existing bonds.³ The overtures of the masters were rejected, and from this point the struggle appears to have entered upon a more serious stage. It is recorded that the pitmen at Hartley Colliery, owned by Thomas Delaval, remained at work "on account of his humane treatment", and at no time did the strikers make any attempt to molest the pits here. When however, Sir R. Milbanke managed to get some men to work in his pit the strikers cut the ropes of the gins, smashed the machinery, and threw it down the shaft.⁴ At other places—notably at Pelton Common—the coal, above and below ground, was set on fire, and the offer of a reward of £100 for information about the incendi-

¹ *Bell Coll., Guard Bk. xi., Cuttings.*

² *S. P. Dom., Geo. III. (1765), 77/46.*

³ *Annual Register (1765), 130.*

⁴ *Gentleman's Magazine (1765), 441-2, 488.*

aries seems to have resulted only in a threatening letter addressed to one of the aldermen. The magistrates soon found the situation beyond their control. "The Punishment of probably 20 or 40 by a month's confinement in a House of Correction does not carry with it the least appearance of Terror [wrote J. B. Ridley to the Earl of Northumberland] . . . and these men that should be so confined wou'd be treated as Martyrs for the good Cause, and be supported and caressed, and at the end of the Time brought home in Triumph". "The whole now turns", he adds, in words that have a not unfamiliar ring to modern ears, "on this single point, whether the Pitmen are to be at Liberty to set the Die on the whole Kingdom that has occasion to buy Coals". After a meeting, on September 11, of magistrates and "of many Gentlemen in the Coal Trade", a request was sent for military assistance, and, in response, a body of dragoons was dispatched north from York.¹

Of the later stages of the dispute we are without information; by September 30 many of the men were back at work, and by October 2 there was a general resumption. The colliers had failed to obtain the desired advance, but on the prime issue of their right to move from one employer to another on the expiration of their bonds they had scored a memorable victory.²

That the strike left the relations between master and servant much the same as before may be shown by the terms of a bond³ made two years later by the hewers and barrowmen employed at Charlaw Colliery in Durham. There are the same provisions against strikes and absenteeism, and similar penalties are imposed for bad coal and improperly filled corves. Wages, however, are

¹ *S. P. Dom.*, Geo. III. 77/47, 77/48; *Cal. H.O. Papers* (1760-65), 1913.

² *Gentleman's Magazine*, 489. See also *Newcastle Chronicle*, September 28, 1765: "'Tis very remarkable, that on Wednesday several pokes of coals were brought from Durham to this town, by one of the common carriers and sold on the Sandhill for 9d. a poke; by which he cleared 6d. a poke. The old proverb, 'Tis needless to carry coals to Newcastle, being in this instance falsified. . . ." See Hammond: *The Skilled Labourer*, ch. ii.

³ Appendix B.

to be paid, not every fortnight, but every three weeks. The fact that the eleven drawers and ten barrowmen who set their marks to the document on November 23 received as arles only 1s. each, and were obliged to bind themselves in the sum of £10 each as surety, suggests that the intensity of the demand for labour had by this time abated.

In a bond¹ made between Sir Thomas Clavering and the drivers of Andrewshouse and Byermoor Collieries on November 20, 1779, the same essential conditions are laid down, though the rates of payment are subject to a greater degree of differentiation, and there is more elaboration of the conditions of employment. In some minor respects the workers had improved their position. The period of engagement was a full year; the hiring money was 22s. for each hewer, and 10s. 6d. for each drawer; and there was no agreement to forfeit a lump sum if the collier failed to fulfil his engagements. The fine imposed for absence from work was still 1s. a day, but—a clause on which considerable stress seems to have been laid—all fines were to be taken at the first pay after the offence, and were not to be held over.

In practice, most colliers, bound as they were by habit, family ties, and perhaps to some extent by settlement, to a particular village, would hire themselves year after year to the same colliery, and would come to be regarded as belonging to that colliery as a soldier belongs to his regiment or a sailor to his ship. But that there was never anything approaching complete immobility of labour is proved by the frequency of notices in the press relating to runaway colliers,² as well as by that of advertisements for labour at all times of the

¹ Appendix B.

² For example: "Pitmen Deserted from Willington Colliery. Martin Shipley, Thos. Galley, Luke Robinson, Joseph Anderton, James Tundell, Matthew Purdy, John Milling, William Frame, and John Frame. It is desired by Matthew Bell & Co. that no Coal Owners or their Agents, or any other Persons whatever, may employ the above Pitmen after this Notice, otherwise they will be prosecuted as the Law directs" (*Cutting in Bell Coll. xx.*, dated May 1786).

year.¹ Moreover, now and then complaints are made that employers did not inquire too closely of applicants for work whether they were free or were bound to another employer; and towards the end of the century it was asserted that "the Coal owners on the Rivers Tyne and Wear have much reason to complain when their men, without cause, abscond, they find an asylum in the collieries in Cumberland by being secreted during the time of their bond by the Owner or agents".² Binding, it appears, was less firmly established in Cumberland, and in 1813 it was estimated that there were 570 pitmen unbound in this coalfield.³

Occasionally men bound to one owner were lent to another. A manuscript dated October 16, 1762, gives the names of a number of pitmen belonging to Long Benton who were bound to other collieries—one to Heworth, one to Byker, seven to Huntley & Co., and so on.⁴ And a document of October 1806 describing the workers at Heaton Colliery illustrates the intrusion of free labour by its division of the colliers into:⁵

Men belonging and bound to Heaton Colliery	. 169
Men belonging to Heaton Colliery unbound	. 39
Strangers bound to Heaton Colliery	. 19

The "strangers" were hewers from Wallsend and other neighbouring villages. At the King Pit, Whitehaven, where apparently only about eighteen men were employed, in November 1804 there were no bondsmen whatsoever.⁶

Notwithstanding this evidence of the existence of some short-period hiring of labour the great majority of the workers were still under the yearly agreement, and so important a part did it play in the life of the coalfield that in an Act for the Security of Collieries and Mines,

¹ E.g. January 9, 1779: "*Wanted*, against May-day next Pitmen that have been used to work in a low seam—Thomas Bell at Simonburn" (Cutting in *Bell Coll.* xix. 179; see also *Ibid.* 451).

² *Ibid.* xiv. 75.

³ Edington, *Treatise on the Coal Trade*, 120.

⁴ *Killingworth and Long Benton Accounts*, 1734-1813, i. (*Watson Coll.*).

⁵ *Watson Coll.*

⁶ *Ibid.*, Memo. Sheet.

passed after the tumults of the year 1800, a clause was inserted punishing by a fine of 40s. or imprisonment men guilty of infringing the annual bond.¹

In the opening years of the nineteenth century the outstanding matters of dispute were the amount of bounty to be paid on hiring, and the date at which the binding should take place. "The pitmen are bound for one year in October or November", said Mr. John Martindale in evidence before the Committee on the Coal Trade² in 1800, "and I have known at these times such a competition to take place as to raise the binding money, or earnest, from one or two guineas (which is the usual sum) to ten and upwards".

Such an increase occurred a few years after this evidence had been given, largely, it was said, as the result of a new demand for labour from the collieries that Vane Tempest was opening up in Northumberland. In 1804, so urgent was the need for colliers that as much as twelve or fourteen guineas a man was paid on the Tyne, and eighteen guineas on the Wear, as hiring money, and in addition there took place an increase of 30 or 40 per cent in the rates of wages.³ During the next year or two, probably as a result of the movement of general prices, the upward trend of wages continued. In 1805 the hewers at Kenton Colliery were bound to hew the "whole coal" at 2s. 6d. per score (of twelve peck corves) and the pillars at 2s. The following year they were bound at the same rates but an allowance of gunpowder was made without charge. In 1807 a further improvement in remuneration was registered, for although, in order to prevent wastefulness, the men were made to supply themselves with gunpowder, the rates of hewers were increased by no less than 6d. a score. "In 1808", wrote a viewer of the colliery,⁴ "I conceived from the little time in which the men did so much work as to make higher wages that a Reduction might have been

¹ Welbourne, *op. cit.* 23; 39 and 40 Geo. III. c. 77.

² *Report*, 558a.

³ M. Dunn, *op. cit.* 28.

⁴ *Bell Coll.*

made; but from the expected scarcity of them I suppose it was not thought prudent to attempt it. In 1809 there is no scarcity, and as no Gunpowder is used, and the Hewers can make Wages in a very short time, there will, I trust, be no difficulty in taking off the advance which was made on their finding gunpowder, and in binding them as before." "The present", it is added, "is a most favourable opportunity, as most collieries have men to spare".

It seems likely that the view expressed here was common to the coal-owners. For on September 30, a meeting held at Newcastle decided to reduce the binding money for householders to 5s. on the Tyne and 10s. 6d. on the Wear, and for single men to 8s. and 13s. 6d. respectively. At the same time a resolution was passed that the binding should be altered from October, the month of maximum sales, to January; and to effect this it was proposed that the ensuing binding should be for three months only.¹

This resolution was not put into effect in 1809, but a year later an attempt was made to reach the same result by introducing, in October, a bond for fifteen months, so that when it lapsed the men would have to take out a new one in January 1812. The result was a seven weeks' strike. Dragoons were brought to the coal-fields from York, and militia was drafted in from as far afield as Caermarthen and Forfar. But the mediation of a clergyman, William Nesfield, finally effected a joint meeting of the owners and two representatives of the men from each colliery. A bond was drawn up giving satisfaction to both parties, and it was agreed that henceforth binding should take place on April 5.²

¹ *Trans. N. of Eng. Inst. Min. Engrs.* xv. 219. That the binding money was still substantial in 1809 is indicated by a MS. (No. 3059) in the *Watson Coll.*, which gives the amount spent on binding some 240 men at Temple Main Colliery as £305:16s.

² Hammond, *op. cit.* 21-4; *Bell Coll., Gd. Bk.* ii. 71. April 5 remained the beginning of the yearly engagement till the practice of binding ceased, though the actual signing took place on the Saturday nearest to fourteen

This was the date of the signing of a bond between the employers and workers at Washington Colliery in 1812. By this time the number of the terms of employment had so increased that instead of inserting them in the indenture the practice had grown up of keeping at the colliery a Condition Book in which they were set forth in full; and the first clause of the Washington Bond accordingly declares that all the terms in the Condition Book shall be as binding as if they had been included in the bond itself. Substantial gains for the colliers are registered in several clauses. If the pit is rendered idle for three successive days, the men are to receive 2s. 6d. each, and boys 1s., provided they are willing to accept other employment offered by their employers. Although the presence of foul coal in the corf still entails a fine, deficient measure is no longer punished in this way, and the only loss to the hewer is that of the payment he would have received if the corf had been full. A standard tub is to be kept at the pit head to test suspected loads, and measurement is to take place in the presence of the hewer. Colliers are to provide their own picks, but are supplied with shovels, mauls, and wedges without charge. Finally, any dispute that may arise is to be submitted to two independent viewers, one selected by each party, and if these disagree, they have the power to appoint a third viewer as arbitrator. To this document were set the marks of 67 hewers, 40 barrowmen, 6 drivers, and 16 banksmen and other workers.¹

It is outside the scope of this book to trace the elaboration of the conditions of employment during the nineteenth century. Suffice it to say that few important changes were made, and that most of the innovations were designed to safeguard the worker against unem-

days previous to April 5. Thus an agreement made in 1863 by the Marchioness of Londonderry with the men at Pencher Colliery was signed on March 21, though it did not come into force till April 5.

¹ *Bell Colli., Gd. Bk. xx.* 321.

ployment or unfair fines.¹ Injustices, of course, continued. The clause obliging the owner to pay 2s. 6d. a day to the collier, if unemployed more than three days, was virtually evaded by the practice of finding a single day's employment after the man had been out of work for three days, and then turning him off again for a further three days of unpaid idleness. In this way it was possible, the men urged, for colliers to be unemployed for three-quarters of the year without any compensation.² Again, complaints were made that when a miner who could not be found employment at his regular task was given alternative work, he received only the half-crown a day that would have come to him if he had not worked at all; and it was claimed that a "furtherance" of at least a shilling a day should be paid in such cases. But the most serious protest of all was directed against the way in which the binding itself was conducted: the document, it is true, was read over to the colliers before they were called upon to set their mark to it, and the Condition Book might be inspected by them at the colliery office. But the annual reading took place in the open air, so that many failed to hear it; the clauses were never explained to the men; and the reader did not stay to listen to objections.³

Furthermore, protests were made that employers sometimes broke their word. Any infringement of the terms of the bond might, in theory, be brought before the magistrates at the Petty Sessions, and redress obtained by injured miners no less than by injured masters.⁴ It is doubtful, however, if (except, perhaps, during the régime of W. P. Roberts, the Pitman's Attorney-General, in the 'forties⁵) the colliers ever made much

¹ Among later bonds we have inspected are the *Killingworth and Burraton Agreements* of 1836 and 1837 [*Watson Coll.*], and the *Pencher Bond* of 1863 in the possession of Colonel Blackett. Specimen bonds are printed in *A Candid Appeal to the Coal Owners and Viewers* (1826), and in the *Children's Employment Comm. Rept.* (1842), 536.

² See *A Voice from the Coal Mines* (1825).

³ *A Candid Appeal to the Coal Owners and Viewers* (1826).

⁴ *Mid. Min. Comm. Rept.* (1843), cvi.

⁵ Welbourne, *op. cit.* 62, 66.

use of their legal rights; and the owners were clearly in a stronger position if they wished to violate either the letter or the spirit of the agreement. In 1822, when the Tyne keelmen were on strike they asserted¹ that "several of our sons who were *bound* to the Colliers as pitmen have of late been discharged by their masters from their service solely because their fathers were Keelmen who had left the employ; thus showing the inutility of the bond for the purpose of binding the master". And three years later a spokesman of the dissatisfied colliers declared:² "We work for money, but it is at the pleasure of our masters to take it from us, we not having the power to claim one farthing if they chuse to construe the bond in the most rigid sense".

Notwithstanding these detailed grievances there was little opposition to the annual binding itself before the eighteen-forties. When in 1831 the owners tried to substitute a monthly for a yearly hiring there was vigorous resistance from the men: "The nature of the employment, the necessity of the coal-owner providing dwellings for the men in the neighbourhood of the pits, the almost distinct community which is formed by the inhabitants of each colliery village, and the great inconvenience which would arise to both parties by frequent removals and changes amongst the men, render the arrangement a necessary one".³ And a broadsheet⁴ issued at the same time declares that a monthly hiring "would render them totally defenceless, at the whim and caprice of the masters, and anyone having a little brief authority under them".

The annual binding agreement had been evolved to meet the needs of a period when transport was primitive and the conditions of industry rarely changed. It was not peculiar to the coal industry, for keelmen,

¹ *Fourth Address of the Keelmen of the Tyne* (1822).

² *A Voice from the Coal Mines* (1825), 19.

³ Philanthropos, *The Two Subjects . . . in dispute between the Coal Owners and Pitmen*, 5.

⁴ In *Bell Coll.*

smiths, ironfounders, and craftsmen of various types in different parts of the country were for long hired under it. But in coal-mining the system was more highly developed than elsewhere, and the miners, always tenacious of old standards, clung to it as a guarantee of customary methods and rates of remuneration. In the eighteenth century the employers counted stability above adaptability, and the workers were willing to sacrifice liberty to security of work and wages. But in the nineteenth century all was changed: it became easier for labour to move, and mobility became a prime industrial virtue. Not stability of employment but a sensitive adjustment of the supply of labour to the ever-changing circumstances of demand became the economic ideal. And, in spite of their innate conservatism, the workers themselves ultimately came to rate freedom to work or not to work, freedom to move, and freedom to combine, above the mere maintenance of safe and customary standards. The strike of 1844 virtually ended the bond in the coalfield of Northumberland; and though in Durham, where there was a larger proportion of lower-grade immigrants, the system lingered for nearly thirty years more, it had clearly lost its usefulness. Since 1872 a fortnightly or weekly hiring has replaced the older methods of engagement, and the colliers have entered the ranks of that weekly wage-earning class the creation of which is one of the prime achievements of industrial society.

CHAPTER VII

THE COLLECTIVE CONTRACT

They hear not the voice of the taskmaster.
The small and great are there;
And the servant is free from his master.

JOB iii. 18-19 (R.V.)

FROM earliest times the arduous and dangerous nature of the miner's calling necessitated some measure of co-operation. In the tiny pits of the Forest of Dean and in other outcrop areas a man might toil alone, but in the larger pits of the developed coalfields the advantages of working in groups are too manifest to need discussion. Many of the early leases were granted not to a single individual but to a body of colliers;¹ and in later times, when it was usual for an entrepreneur to intervene between the landowner and the working miner, it was his practice in many places to hire labour in gangs or companies, each represented in bargaining by a leader known as a charter-master. Sometimes the entire working of a pit would be undertaken by such a group, and in this case the workers had a substantial measure of control over the conditions of their working life. The functions of the colliery proprietor were then confined to providing the capital, determining the broad methods of work, and finding markets for the produce; they were thus largely commercial, and the system was not unlike the "merchant capitalism" of the domestic textile and metal-working trades.

At the larger collieries, however, it was customary for the master to appoint over each pit an official—he was called a bailiff at Griff and an auditor at Haigh—

¹ In 1477, for example, a coal-mine at Stratton, Somerset, was leased to six working colliers. *V.C.H. Somerset*, 380.

to see that the boundaries of the royalty were not exceeded and to supervise the work of the colliers. Moreover, when the scale of production was sufficiently great, some of the workers were specialised to such tasks as driving levels, filling up the waste, and firing the "damp", and these were generally hired and paid individually. Where this was so, the proprietor, through his agents, exercised some control over the methods of work and hours of labour, not only of these specialists, but also of those engaged in getting coal as members of a gang of contractors.

The collective hiring of labour at the beginning of the century may be illustrated by entries in the "Coal Pit Book for ye Great Rider" of Sir Richard Newdigate's colliery at Griff in Warwickshire. In 1701 this consisted of five working pits each of which was controlled by a bailiff who supervised the work and was responsible for the tools and equipment (mandrels, shovels, ropes, chains, and skips) supplied by the proprietor.¹ At the First Basset Pit sinking was being carried on, during the week ending August 8, by a body of men, known as J. Price's Company, who were paid a group piece-wage which increased with the depth; and at the other pits, where companies of men were engaged in getting and drawing coal, a "chalter" or group remuneration was also received. The entries for one of these are set out below:

2d Basset Pit wth Barrell Gin. Comp: Henry Bettridg

	£	s.	d.
Chalter for 19 ^{ld} and $\frac{1}{2}$ at 22d each	1	15	1
Heading 8 ell down hill 18d each		12	0
15 levell head	1	10	0
5 men coupling the shaft $\frac{1}{2}$ turn each		3	9
5 more 1 turn each 4 more 1 turn each		13	6
James Bonser getting coal $\frac{1}{2}$ a turn.			9
J. Johnson Sen, and 4 Coleorton men the same each		5	0

¹ Two of the bailiffs received 6s., two 5s., and one 4s. a week—rates of pay certainly not in excess of those obtained by the coal-getters.

At the other pits there was a similar organisation: a bailiff supervised on behalf of the employer, and a working collier, from whom the company took its name, acted as leader of the men. At each of four pits there was only a single company at work, but in the Third Basset Pit two separate gangs were engaged in getting and drawing coal at the standard rate of 22d. a load.

Since the earnings of the working colliers were paid to the group as a whole it is not possible to state exactly the weekly income of the individual. Whenever, however, underground work, such as cleansing the bottom of the shaft, was performed for time-wages the rate was 1s. 6d. a day, and this was also the invariable rate for hewers, when employed, as they were occasionally, for day-wages. Under the charter system it may be presumed that earnings would be somewhat higher; for in the seventeen-twenties there are frequent entries of 2d. a day "to mend wages" paid to those taken from hewing or other contract work and made into "wagemen"—a payment corresponding to the "furtherance" customarily made in similar circumstances in the Great Northern Coalfield.¹

Another feature of the wages system here, as elsewhere, was the payment of a subsistence. Each week the colliers received only part of their earnings; the balance was handed over at a settlement made, not at fixed times, but apparently when the proprietor found it convenient. The receipt of such balances was registered in the Coal Pit Book by entries of which the following are typical:

1702 *Ap.* 28. Recd. then of Sir Ri Newdigate the sum of four pounds nineteen shillings and six pence in full for our Company till the 3d instant we say recd. by us

WM X PAGE.

THO X MORTON.

JAMES X BONSER.

¹ *Griff Coal Pit Accounts Book*, 1723-34:

17 May, 1729. One Wageman 5 turns at 2d. to mend wages . . . 10d.

12 Wagemen 27 turns at 2d. to mend wages . . . 4s. 6d.

1702 *May 1*. Memorand. then pd Thos Cooper and Wm. Petty the remainder of the Reconing to their Company being One pound Eight shillings a(nd) 6p. H. W.

ROBT. DEAKIN.

TIMOTHY NORBURY.

It seems likely that at Griff the colliers had completed their task when they had got the coal to the pit bottom. But in other places where there was a similar form of organisation they had the further duty of winding to the surface and delivering the coal to the buyer. Such had been the practice a century and a half earlier at Wollaton, in Nottingham, where a collier in the employ of the Willoughbys received from the customer to whom he had carried his output of coal a "merke" or token which he had to hand over to the gatekeeper of the colliery as a proof of delivery.¹ And such, apparently, was the custom early in the eighteenth century in the Shropshire coalfield, where the principal sales of coal were to the ironmasters of the district about Coalbrookdale. Entries like the following from the Day Book of the first Abraham Darby are suggestive of the lines of organisation of the coal industry in this area:

1709 *8th Cr.* 8. Richard Hartshorn & Comp. £ s. d.
By Cash paid Dorrall for getting Coals by thayer order 11 19 6

And similar entries in the Cash Books of later years fill in the details. For example:

1721 *May 8th*. By Richard Hartshorn pd. his Coll^{rs}, gett^g Coal to May ye 6 viz
Richd Dorrall £10.17.11, Wm. Crippen £9.9.9.
Wm. Garbitt £3.13.1, Jno Crippen £6.6.3, Robt Garbitt £4.0.7.

Richard Hartshorn was a master-collier who is known to have leased from Lord Gower a coal-mine at Little Wenlock.² And it seems very probable—especially in view of what we know of conditions in neighbouring coalfields—that men like Dorall, the Crippens, and the Garbitts were charter-masters employed in work-

¹ *V.C.H. Nottingham*, II, 327.

² *V.C.H. Shropshire*, I, 461.

ing pits and carrying coal to the ironworks. During the 'thirties the Coalbrookdale Company was working small pits of its own; but towards the middle of the century the chief source of supply was the colliery at Madeley Wood owned by the Foresters. Entries such as

1747. 10½ 8mo. By William and Brook Forester Esq ^{rs} pd	£	s.	d.
their Colliers to ye 20th 7mo.	71	9	8

imply that the ironworks still bought its fuel from the working miners, and not from the proprietors of the colliery.

Evidence of the existence of a charter system in Derbyshire is furnished by the records of several coal-masters, and notably by those of John Barnes of Ashgate, near Chesterfield, between the years 1763 and 1779. Here when operations were initiated in 1763 the sinking was undertaken by the members of a family named Booker, who contracted for the work at a collective piece-wage; and the working of the coal was also the subject of a bargain with a company of colliers. Thus, during the year 1764, George Bramwell and Co. were regularly paid "to get, draw, and sale" coal at 2s. 1d. a load—a rate that persisted till after 1767, when 2s. 2d. became the regular contract price. The phrase "get, draw, and sale", which is the formula used throughout the record, is probably not in this case to be taken as implying that the coal was actually delivered to the customer by the working colliers: the word "sale" is evidently used here, as at Griff, with the meaning "expose for sale",¹ and the task of the gang of colliers was complete when they had stacked the coal on the pit bank.

Barnes supplied the miners with such necessities as pit-props and candles; he paid specialised workers to maintain the underground ways and attend to the pumps; and sometimes he engaged individual coal-getters to work for day-wages. Both charter-masters and these solitary workers were paid at a reckoning made

¹ See *Oxford Dictionary*, s.v. Sale.

roughly every third week, and, apart from the fact that the proportion of coal got by charter was usually somewhat greater, the following statement for one of these periods may be regarded as typical:

	£.	s.	d.
1766 Jan. 25. Got 77 Loads and sold at 4s. 6d. per load	17	6	6
<hr/>			
Pd. to get 56 loads by charter at 2s. 1d.			
p. load	5	16	8
Pd. to get 21 loads by day	5	15	0½
Pd. to drive 10 yards of Level at 1s. 6d.		15	0
„ to get 40 puncheons at 8d.		1	4
„ to Samuel Redfern a smith Bill		3	2
<hr/>			
	12	11	2½
Profit	4	15	3½

For the neighbouring Hasland Colliery (the forerunner of the Grassmoor Colliery of to-day) the only surviving record is a Cash Book, 1787-1810, which, from its nature, can throw but an indirect light on the conditions of employment.¹ Nevertheless, stray entries such as

Nov. 9. 1788. To sundry exps. at South Normanton when agreeing with a Compy of Colliers 18s.

and

Jan. 19, 1789. George Hemmingrove & Co. of earnest . . . 3s. 6d.

indicate once more the collective contract for labour.

At Tibshelf, Norbrigg, Tupton Woodthorpe, and Wingfield Collieries in the same locality, a similar system of engagement existed in the early years of the nineteenth century. But here the charter men had to pay the cost of punching the pit, of raising the coal, including the wages of one of the two banksmen, and—at least at Norbriggs—of delivering the coal in iron corves at the canal.²

¹ It was owned in 1787 by a John Brocksope, who not only mined the coal, but coked the bulk of it at his own furnaces and sold the product to the ironworks about Chesterfield.

² Farey, *op. cit.* i, 341; Sorby in *Trans. Inst. Min. Engrs.* xlv. 92.

A final illustration of the system in Derbyshire is afforded by the records of Benjamin Outram & Co. (now known as the Butterly Coal & Iron Co., Ltd.¹). Here, when bargains for cutting coal were concluded, a small payment was at once made by way of earnest; thereafter round sums were paid as "subsistence" each fortnight; and a final balance was struck on the completion of the work. A statement for the period March 21–April 3, 1795, shows that three companies of colliers were paid an aggregate of £50:16s. in wages; two of the companies received their remuneration in a lump sum, but the members of the third were paid individually for time or piece work. Half-a-crown a day appears to have been the usual wage at this time.²

It is uncertain whether, as at Griff, each company had control of a separate pit. But that this was sometimes the practice is shown by entries in an Agreement Book, beginning in the year 1800, which records the detailed terms on which a body of six colliers undertook the working of a pit in Codnor Park. These men, whose names are set forth, engaged to get all the coals in the pit "to the length of eighty yards along the level and as far towards the Basset as the Bailiff of the Field shall judge necessary or the coals shall be worth getting". They were to be provided with all necessary tools, but they undertook to keep these in repair, and to deliver them up in good condition at the end of the contract; they were themselves to find all wood necessary in getting the coals, and to provide "gin horses, drivers, asses and every other matter and thing . . . necessary for getting drawing turning loading and delivering the said coals into Gang-waggons on the Pit bank". If they failed to keep the underground ways in good order the Bailiff of the Field might take these into his own hands and deduct the expenses of maintaining them from the

¹ This concern originated in a partnership between Benjamin Outram, Francis Beresford, William Jessop, and John Wright, and the coal raised was consumed mainly in the smelting furnaces of the same firm.

² *Butterly Company's Cash Book*, 1790–96.

earnings of the company. The remuneration was to be 3s. 6d. for every ton (of 25 cwts.) of coals, and 1s. 9d. for good round slack, payable at the monthly reckonings of the firm; if the men failed to reach an output of 75 tons in a week they were to forfeit 3d. for each ton short, and if they obtained more than 75 tons they were to receive a premium of 3d. a ton on the excess. Finally, if it should be necessary to sink another pit to get the coal they were to be paid ten guineas for sinking it. That the six colliers were regarded as employees and not as independent contractors is implied by their undertaking to conform to all the "rules, regulations, penalties, and forfeitures" established for the orderly management of the works, and to contribute to the fund for the support of the sick.

The examples of the collective contract so far presented have been drawn exclusively from the coalfields of Warwickshire, Shropshire, and Derbyshire, and it was clearly in these areas that the system predominated. But that it was not confined to the Midlands is proved by even a casual survey of the records of collieries in other parts. After 1786 it appeared, as already pointed out, in the colliery of the Bradshaighs at Haigh in Lancashire, but here it was clearly an importation from Shropshire and not an indigenous growth.¹ Its existence in Yorkshire some years later is proved by entries in the Cash Books of Messrs. J. & J. Charlesworth of Wakefield, who, in 1809, were working seven pits, each one of which was described eponymously, presumably after the head of the gang that worked it. Entries like

	£	s.	d.
1809, Oct. 21. Jn ^o Dawson & Co. Let Pit Earnst . . .	8	8	0
Gave do. to Drink	1	1	0

are further evidence that the group of colliers here undertook not merely particular pieces of work, but, as at Codnor Park, the whole conduct of the pit.

¹ *Supra*, 31.

The features of the system as it existed in South Wales are laid down in a number of agreements made by the Ebbw Vale Iron Company with charter-masters, each of whom undertook the supply of coal for a particular use. On March 28, 1796, for example, one John Morgan contracted to cut coal and deliver it at the furnace coke-yard in quantities sufficient to make at least a dozen barrows of coke every day of the week for a year; in return for this he was to receive the sum of 12s. for every dozen barrow-loads. Morgan was to find all tools and candles, open out his own stalls, and drive the headings and mainways; but his employers supplied rails for the corves to run on and also paid the wages of the two drawers. He was to have as a perquisite, and was free to sell, all small coals or other coal unfit for use at the ironworks, but was to forfeit five guineas a sack if he sold any large coal without the consent of his employers.

On August 10 of the same year another collier, David Adams, made an agreement to supply three tons of coal every day for the fire-engine, at a rate of 2s. 2d. a ton, and also to find coal for the workmen's houses at a price of 6d. a week each, as well as for the smith's shop and the offices of the Ebbw Vale Company. That he did not work alone is evidenced by the size of the contract; and if further proof is needed that he was the head of a gang of working colliers it is afforded by an indenture of December 22, 1799, under which the Ebbw Vale Company undertook to remove the coal so that Adams's getters should be hindered as little as possible. Entries in a Journal of 1796 throw light on the manner in which the charter-master was financed. In August, Adams received a loan of £15 on account of coal delivered, another £15 on account of stalls opened, and £19 on account of headings and mainways. And again on September 3, £13:1:10 was advanced to him for coals and £22:17:7 for stalls which had been opened. A final balance between Adams and his employers

would no doubt be struck at the expiration of the agreement.

For North Wales evidence is not easily obtained; but in the early nineteenth century the lines of industrial organisation were clearly identical with those just described. In 1826, at Coed Talon, near Mold, the charter-masters received 3s. or 3s. 3d. a ton, out of which they had to meet the costs of hewing, raising the coal to the surface, timbering the pit, and "upholding" the stock of waggons and chains. The banksmen, however, were paid by the colliery-owner, and tram-rails and ropes were also supplied by him.¹

Finally, in Ireland, in the small coalfield of Castle Comer, near Kilkenny, the same arrangement can be observed. Pits were sunk at the charge of the proprietor, but all underground work, together with winding, was the subject of contracts with master-colliers. In 1726 the Irish car-load of coal sold at the pit head for 9d., and of this 3d. went to the master-collier and 6d. to the owner. If the proportional distribution of the product was the same a hundred years later, it is small wonder if complaints were made that the colliers sometimes covertly sold their output and kept the cash, instead of delivering the coal to the proprietor.²

At the risk of being tedious we have now presented evidence of group production in the widely scattered coal areas of Warwickshire, Shropshire, Derbyshire, Lancashire, Yorkshire, Flint, Glamorgan, and Kilkenny. There are significant omissions. No instance has been drawn from any colliery north of Wakefield and Wigan, no description has been given of a charter system in the great coalfields of Scotland, Cumberland, Northumberland, and Durham.³ This must not be taken to mean that the entrepreneurs always controlled the getting of coal in these areas, for pits were sometimes

¹ *Watson Coll.*

² M. Dunn, *View of the Coal Trade* (1844), 143, 147, 152.

³ *Watson Coll. D.* 24, 4.

let as going concerns to sub-contractors. In 1747, to give one example, the proprietors of Lemmington Colliery (Durham) "agreed with Geo. Fisher and Geo. Humble to work their Pitts at 10d p Score, Viz they are to find Candles, head^s, Shiftwork and Overmen's wages, and the Banksmen are to Sledys out of all the Pits at the rate and price of 2½d".¹ And similar contracts were made for the working of East Rainton Colliery in 1797, and Pawsher Colliery in 1801.² It seems unlikely, however, that men like Fisher and Humble were simply charter-masters: the fact that they were employers of overmen implies that they were not themselves working colliers or leaders of companies of workers; they were rather small-capitalist sub-lessees.

Specialised work, like that of boring, sinking, driving, corving, maintaining the underground ways, and transporting coal on the surface, was also often made the subject of a bargain with a contractor in the north of England. In May 1764, for instance, William Gibson, who leased Tynemouth Shire Moor Colliery of the Earl of Northumberland, invited contracts for the winning of the coal "at the deep", and also for the drawing of the coal and the keeping in repair of the waggon-ways "by tentale".³ In 1800 a William Buchanan & Co. contracted for the driving of levels at Howgill Colliery (Cumberland). In 1805 a Thomas Walker undertook the corving at Heaton Colliery, Durham.⁴ And the reader may be reminded that the famous George Stephenson, along with two others, contracted for the working of the engines at Killingworth Colliery.⁵

Nevertheless, it is beyond doubt that in these coal-fields the actual hewing and drawing of the coal were

¹ *Journal of John Watson.*

² *Bell Coll.* xvi. 360.

³ Newspaper cutting in Newcastle Munic. Ref. Library.

⁴ He proposed to take over the existing curves at a valuation and undertook to draw coals at the rate of 9d. a score of 20 or 24 peck corves. His journeymen were to be provided with free houses and fuel, and if he were unable to find them regular work the owners of Heaton Colliery were to employ them at 3s. a day.

⁵ Nicholas Wood in *Trans. N. of Eng. Inst. Min. Engrs.* viii. 37.

almost invariably performed under contracts made with individual colliers and not with gangs or companies. A viewer was responsible for the colliery as a whole, and an overman was in charge of the pits; but these were salaried officials, like the bailiffs and auditors of the coal areas farther south; there were few, if any, sub-contractors in coal-getting.

It may be that the group contract, and the truck system that came to be associated with it, were methods of overcoming the difficulties arising from lack of capital on the part of the mine-owner: if so, it was natural that they should appear in the Midlands, where the employers were relatively poor, and that they should be absent in Northumberland and Durham, where the employers were men of rank and property.¹ Again, it is possible that the difficulty of supervising relatively large numbers of men, burrowing in many small pits, at a time before modern large-scale management had come into being, may be a partial explanation of the existence of the collective contract of the Midland and Welsh coalfields.² In the North, on the other hand, the pits were sufficiently large, the industry was sufficiently concentrated, to make possible the evolution of a hierarchy of officials, and hence the direct engagement of individual hewers and drawers by the owner of the colliery. A more probable explanation of the difference in organisation rests, however, in the difference in methods of working coal which have been discussed in Chapter II. For it is obvious that in the narrow bords or stalls of the northern coalfields the individual must usually work alone—or at the best be assisted by a single marrow—whereas a considerable degree of co-

¹ *Report of Midland Mining Comm.* (1843), xxxiii. ciii. civ.

² It was perhaps for this reason that the "captains" of the Cornish tin and copper mines hired their "tutworkers" and "tributers" by a collective contract (Clapham, *Economic History of Modern Britain: The Early Railway Age*, 187, based on G. R. Lewis, *The Stannaries*, and V.C.H. Cornwall. See also Hamilton Jenkins, *The Cornish Miner*). Contracting groups were also common in shipbuilding and agriculture (Clapham, *op. cit.* 57, 199).

operation and division of labour is required by the Shropshire method of longwall working. The collective contract and the individual bond thus reflect peculiarities of technique which are themselves ultimately determined by geological conditions.

It is unlikely that the companies of working colliers ever defined in writing the relations between individuals within the group. But in some instances entries in the colliery books lead one to infer a co-partnership system with substantial equality of status of the individual workers. At Griff Colliery, in 1702, for example, suggestions for changes in work were made by Sir Richard Newdigate, not to charter-masters, but to the companies of colliers as a whole;¹ and the fact that two or three members of the company often signed, or set their mark on, the receipt suggests a partnership rather than a gang of men subordinate to a contractor. Again the six colliers who made the agreement to work the pit at Codnor Park in Derbyshire² were clearly equals; and when the men in the gangs at Ebbw Vale and Butterly were put on time-wages, all received the same rate of pay.

In some cases, however, the leader of the gang was something more than a mouthpiece for his fellows: at Bowling, Low Moor, and Bierley in Yorkshire he came to be known as a "pit taker", who contracted to get coal at so much a dozen corves, provided a gin horse, paid men, boys, and women a weekly wage, and pocketed the difference.³ And in 1826, at Coed Talon in North Wales, a charter-master who was paid 3s. a yard for driving crosses handed over 2s. 4d. to the men in his gang and kept 8d. as his own profit.⁴ When the system took this form the principal line of cleavage in the industry was between labour and the contractor; and it is noteworthy that when strikes occurred, as in Staffordshire in 1816, they were directed not against the owners

¹ *Coal Book for ye Great Rider, Griff MSS.*

² *Agreement Book, 1800, Butterly MSS.*

³ Cudworth, *Histories of Bolton and Bowling*, 238.

⁴ *Watson MSS.*, 3016.

of the collieries, but against the intermediary charter-masters.¹

Some clear cases of co-operative production in the eighteenth century, and some equally clear cases of sub-contracting in the nineteenth, support the view of Thomas Tancred, in the First Report of the Midland Mining Commission,² as to its origin:

"I am inclined to believe that the 'pits company' as the miners working together in a pit are still called, used in former times to engage in a body with the proprietor to raise the mineral at a given price per ton, and that there was a head man of the company chosen by the rest for his superior experience or age, hence called a gaffer, who entered into the contract in the name of the rest, directed their operations, and worked along with them, all having a common interest in the concern like the crew of a fishing-boat, or like the miners in Cornwall".

The word "gaffer" itself, it is pointed out, originally implied an elder, and in Shropshire "butty" conveyed the idea of a partner, while in South Wales and elsewhere the word is still used as a synonym for "companion". But when Tancred wrote in 1843 the import of these terms had changed:³

"Butties . . . or gaffers . . . are contractors, or charter-masters, who, having in general been themselves working miners, or the sons of butties who have risen from that class, are enabled by the accumulation of some little capital, or by the assistance of relations, to take a pit, either singly or two or three in partnership, and to enter into a bond to raise the mineral . . . at a given price, called a charter, per ton, for the proprietor or lessee of the mine".

By a process for which there are parallels in the fourteenth, and probably in all succeeding centuries, the more powerful personalities among the workers, having acquired a little capital, ceased to be simply leaders and

¹ *Annual Register*, 1816, p. 13.

² P. xxxiv.

³ *Ibid.*

became masters, intervening between the men of property and the working colliers. The more or less democratic copartnery of earlier times, it would seem, had as its degenerate offspring the hated butty system of the nineteenth century.¹

¹ For a nineteenth-century example of the same process of transmutation of gang-leaders into masters in agriculture see Clapham, *op. cit.* 468-9.

CHAPTER VIII

CORN RIOTS

He wandereth abroad for bread, saying, Where is it?

JOB xv. 23.

IT will be shown in the following chapter that over the greater part of the eighteenth century money wages exhibited remarkable rigidity, and this existed in face of very considerable fluctuations in the fortunes of the industry. The fact must not be taken to imply that all was well with the collier and that he remained contented with his lot. If money wages varied little the prices of foodstuffs were liable to sudden and frequent changes, occasioned mainly by harvest conditions and the alternations of war and peace. In these circumstances the real wages of the collier varied enormously; and in years of food shortage, when his standard of life was seriously threatened, his dissatisfaction burst forth into violence, directed generally, not against his employer, but against the millers and bakers, who, since they stood to gain by an upward movement of the price of the staple food, were generally held responsible for that movement. In the corn riots that invariably followed the deficient harvests the coal-miners took a leading part. It is the purpose of this chapter to describe the chief of these "rebellions of the belly" on the coalfields, and to establish the connection between social disharmony and the price of food.

During the greater part of the eighteenth century the policy of stimulating agriculture was operated under the Corn Bounty Act¹ of 1689, which put a premium on the export of wheat when the price fell below 48s. In

¹ 1 William & Mary, c. 12.

years of plenty the workers felt that they were thus deprived of their full share of prosperity; and since 48s. was a relatively high price for the early part of the century, even in years of but moderate or poor harvests wheat might be sent abroad. When serious dearth threatened the bounty was obviously inoperative, but there was no automatic prohibition of export; and it was usually only after prices had reached famine level, and rioting had actually broken out, that grain was prevented from going overseas.

The first sixty-five years of the century were marked by relatively low prices, and after 1703, according to Tooke,¹ there were only four brief periods of deficiency, the years 1709, 1727-28, 1740, 1756-57, and one of "doubtful produce", 1752-55. Each of these was a time of pronounced trouble among the working classes, and in each disturbances occurred on the coalfields. For the first two information is meagre, but for the later periods the evidence of the disorders is abundant.

In 1709 a winter of severe frost and a summer of cold and rain brought a rapid increase in the price of grain. Whereas at Ladyday 1708 wheat had sold for 27s. 3d., by Michaelmas of the following year it had reached 81s. 9d., and this in spite of the total prohibition of export. Food shortage was probably a contributory cause of the riots of the keelmen of the Tyne in 1710, though they had also grudges against their employers for their misuse of the funds set aside to provide a keelmen's hospital.² By 1712, however, prices were down to the normal level, and during the following fifteen years the fluctuations were only moderate. Between Ladyday 1727 and Ladyday 1728 wheat rose from 32s. 11d. to 49s. 2d., largely, it would appear, as the result of an excessively rainy summer; and the normal balance of export was displaced by an import balance.³ In November 1727 a body of 2000

¹ *History of Prices*, i. 35, 40, 46.

² *Infra*, 197.

³ Tooke, *op. cit.* 40-41.

tin-miners, armed with clubs, entered Falmouth and plundered several granaries, and later at other places in Cornwall the mob compelled the constables to go with them to order the doors of storehouses to be opened. Troops were sent to Falmouth in November, but so prolonged was the rising that in the following May it was necessary to send reinforcements.¹ A fortnight before the first report of this trouble the Justices of Gloucestershire reported outrages by "several licentious persons (particularly our coleworkers) who have held unwarrantable assemblies and committed great Riots and Disorders"; and, although it was against the turnpike on the road leading to Bristol that the colliers' animosity was directed, in view of what was happening in Cornwall, it does not seem unlikely that the rising price of wheat was a contributing cause.² The shortage of grain was, however, never so acute as in 1709, and, in spite of protests, freedom of export was maintained.

During the following twelve years prices were abnormally low, and if there was distress it was among the landowners and farmers, and not among the manufacturing classes. But the winter of 1739, like that of 1709, was exceptionally severe, and the harvest of 1740 was deficient. At Oxford the price of wheat at Michaelmas 1738 was only 20s. 2d.; at the same season of 1740 it was 59s., so that within two years it had practically trebled.³ In the north of England matters were made worse by the persistence of the north-east winds, which seriously hampered navigation—in April the return of the Customs House at Sunderland showed that the number of ships that had entered the port was 500 less than usual⁴—and, since this must have produced short working at the pits, to the evil of high prices was added the menace of unemployment.

On May 19, 1740, the North was involved in a "rebellion" which was at first exclusively the work of

¹ *S. P. Dom. Entry Bk.* 125, pp. 184, 187, 190, 247. ² *Ibid.* p. 177.

³ *Ibid.* 43n.

⁴ *S. P. Dom. Geo. II.* (1740), 50/142.

women. When, five days later, the bailiffs of Durham approached the town of Stockton-on-Tees they met "a Lady with a stick and a horn going towards Norton to raise the people"; and at Durham, where demonstrators from the neighbouring villages were in the streets all night, it was reported that "no man appears amongst them".¹ A fortnight later, however, it is clear that the women were not left unsupported: on June 6 a body of men and women boarded a vessel loading corn for Amsterdam, forced the crew to go ashore, broke open the hatches, and carried away part of the cargo. And, four days after, the High Sheriff informed the Bishop of Durham that the rioters at Stockton, who numbered three thousand, had sent for the colliers of Ederly and Caterthorn, estimated at six or eight hundred, to join them.²

Both persuasion and force were invoked to restore order. On the one hand, the merchants of Stockton deposited a thousand bushels of grain which were to be sold to the poor at the low price of 4s.;³ on the other, the posse was raised, and a thousand horse proceeded against the rioters. After a skirmish on June 13 seven rioters, including two women, were taken and carried to Durham Gaol; but the Durham mob rushed to their rescue and one of them was actually liberated at the prison door.⁴

Meanwhile the pitmen of the Tyne had broken into the granaries of several merchants in Newcastle and had carried off quantities of grain from the corn carriages in the streets. In spite of the offer of the merchants to provide wheat and rye at substantially reduced prices the miners refused to return to work, and declared their intention of enforcing an advance of wages.

With the pits idle the keelmen must soon have been unemployed, and they probably required little per-

¹ *S. P. Dom. Geo. II.* (1740), 50/133, 50/142.

² *Ibid.* 51/33, 51/13.

³ *Ibid.* 51/38.

⁴ *Ibid.* 51/55.

suasion to throw in their lot with the colliers. On June 26 they entered Newcastle "in terrible numbers and with all sorts of weapons", and joining the pitmen, who marched with drums beating and colours flying, they prevented the Lord Mayor from assembling the posse. In the general disorder one of the colliers was killed, whereupon a mass attack was made on the Guildhall. Stones were thrown through the windows "like cannon shot"; the magistrates were driven out; the benches of justice were demolished; deeds and records were flung to the winds; and about £1400 was taken from the "public hutch" or chest. Before noon the Guildhall, "a large and Beautiful fabric", was a complete ruin.¹

In other coalfields similar events were taking place. At Pembroke on May 23 a number of colliers broke open the hatches of a vessel laden with corn for Bristol and carried away part of the cargo. Then, forcing their way to the market, they demanded corn at their own price and threatened, if they were denied, to set fire to the town. Though one or two were arrested the magistrates were obliged to release them, and an appeal was made for a detachment of 20 soldiers from Caermarthen. Clearly the affair at Pembroke was a mere frontier raid: on June 17 the Duke of Newcastle was informed that the disorders had ceased, and that "such care is now taken by ye owners of ye collerys to supply ye men wth corn and to keep 'em in order y^t no disturbance can happen for ye future".²

In North Wales, on the other hand, the trouble was widespread, and for a time the ordinary means of communication with the rest of the country were cut off. On May 21 the colliers from Mostyn, Bychton, and Trelogan, some of them armed with muskets, halberds, and pikes, which they had taken from Mostyn Hall, marched into Rhuddlan, four or five hundred strong, and seized a waggon of corn on its way to a vessel bound for Liverpool. In reply to remonstrances they

¹ *S. P. Dom. Geo. II.* (1740), 51/50.

² *Ibid.* 50/140, 51/43.

declared that the corn had been intended for their enemies, the Spaniards, that they and their families were in need of bread, and that they would rather be hanged than starved. The granary of a dealer, John Colley, was cleared of wheat and oats; a barrel of gunpowder which was found in his house was exploded on the marsh; and some of the mob threatened that, if they could catch Mr. Colley, "they would cutt his head off, and sett upon Disarth finger post and tye his gutts ab^t it". Colley, however, had taken to the fields, and was sending out frantic messages for help from his hiding-place under a hedge.¹

Two days later the number of rioters had increased to between 700 and 1000; and 300 more, it was reported, were marching from Denbigh to join them.² On May 26 some of the mob forced their way into the house of a corn-dealer of Rhyl, "devoured what meat and drink they thought convenient", and forced him and four others to sign a bond not to send any corn away by sea. And on June 6, a crowd, among whom once more women predominated, unloaded a ship's cargo of wheat.³

A detachment of 100 soldiers was sent from Chester to Rhuddlan, and other companies of the same size were stationed at Flint and Holywell. But, though it was not difficult to defend these places, it was less easy to prevent the rioters from plundering the country-side or to ensure that, if the troops left, the outbreaks would not be renewed: a corn-dealer who had obtained information against a number of colliers declared that his life would be worth little if the military protection were withdrawn, and that he would "choose to become a Volunteer in his Majesty's service as Common Soldier, if I can't get a Commission, rather than stay at home to be Porteousis'd by these Ruffians".

The colliers were not the only workers involved—

¹ *S. P. Dom. Geo. II.* (1740), 51/23, 51/37.

² *Ibid.* 50/143.

³ *Ibid.* 51/27.

iron-smelters and others were also in revolt—but it is clear that they were the most formidable of the rioters. They had some rudiments of military organisation and discipline, they were armed, and when the troops appeared they dispersed to their pits, where it was hazardous for the soldiers to follow them. By June 13, however, a number of the ringleaders had been taken, and the riots were at an end.

For many years following the prices of foodstuffs remained moderate and there was peace on the coal-fields. In 1750, it is true, coal-miners took part in the turnpike riot in Somerset, but this was a local incident of little importance.¹ Three years later, however, a sudden upward movement of the price of grain led to serious disturbances in the same region. On May 15 about 700 colliers assembled at Shepton Mallet, entered inns where corn had been lodged, and forced the owners to sell at prices which they considered reasonable. A week later the Kingswood coal-miners, headed by a captain and bearing colours, entered Bristol, 2000 in number, and presented to the Mayor and Corporation a petition against the high price of bread. Prevented by constables from unloading a vessel in which corn had been put for export, they retaliated by breaking the windows of the Council House; and for a week the trade of the city was at a standstill. When, on May 25, a force of Scots Greys arrived from Gloucester, the rioters retired to Kingswood, carrying off a number of townspeople, no doubt in the hope of exchanging them later for the thirty colliers who were in the hands of the military. A week later, however, the townspeople were released, and, as evidence that there was no great resentment, surgeons were sent from Bristol to attend the wounded colliers, and donations were raised to send provisions to Kingswood. The sentence of six months passed on one, and two years on seven others, of the arrested coal-miners were lighter than was usual in such

¹ *The Scots Magazine* (1750), cited *Gentleman's Magazine* (1750), 199.

cases, and are a further indication that there was little ill-will.¹

The outbreak of the Seven Years' War in 1756 would probably, in any case, have been signalled by a rise in the price of foodstuffs; but a deficient harvest made the upward movement certain. Early in the year wheat had sold at Mark Lane for 22s.-26s. a quarter; but by the middle of 1757 it fetched 67s.-72s.

In the coalfields of the Midlands it was usual to begin the winter sale of coal immediately after the harvests had been gathered, when the farmers' horses and carts were available for transport. This year, however, the excessive rain had so held back the crops that the farmers were occupied with their own affairs till quite late in the autumn. And even where labour and horses were procurable the rain had made the roads so bad that, in some places, it was impossible to move the coal from the pit head. As stocks accumulated men were turned off work, at the very time when the mounting prices of foodstuffs made life difficult enough for the poor; and, once again, looking about for a human source of their distresses, the miners found it in the dealers in wheat and other provisions.²

Many of these dealers were Quakers, and when in August 1756 riots broke out in the neighbourhood of Nuneaton, the immediate cause was the action of two Quaker corn merchants who, it was alleged, had bought up wheat and cheese with the intention of sending them abroad. Quaker meeting-houses at Atherstone and Hartshill were destroyed and the residences of Quakers were plundered.³ A few days later 300 colliers from Bedworth entered Coventry to protest against the sending abroad of corn, cheese, and oxen, and to urge that grain should not be sold by sample but should be brought in bulk to the market. There was no violence,

¹ Nicholls and Taylor, *Bristol Past and Present*, iii. 189-91; *S. P. Dom. Geo. II.* (1754), 125/5, 125/24; *Gentleman's Magazine* (1753), 246-7, 294.

² *S. P. Dom. Geo. II.* (1756), 135/70.

³ *Ibid.* 135/61.

but the men threatened that if the farmers did not sell their grain at a reasonable price next market day the colliers would sell it for them; and so powerful were they that, in informing the Secretary of State of the trouble, the Mayor of Coventry was obliged to dispatch his letter from Daventry since he dared not send it from his own town. Another informant,¹ who would not set his name to his letter, said that the colliers from Coleorton in Leicestershire were to set out the same day "upon the scheme of reducing the price of corn", and that they had a "correspondence" with the Warwickshire men. "I need not observe", he added, "that ye Circumstances of Colliers are very different to any other men not only as they all act in League and would stand by one another thro'ought the Kingdom, and are desperate fellows (which is seen by their attacking Gaols to release any that are confined) but besides this they think they can at any time hide themselves and they know that ye Kingdom cannot do without Coals and they know that other People can't do their Work".

However, the Coleorton colliers did not come, for their master prevented their taking tools from the pit to serve as arms. And the presence of troops and special constables ensured the safety of Coventry, though the Warwickshire colliers levied contributions on the inhabitants of several villages to the north of the city.²

Meanwhile rioters had been active in pulling down corn-mills in Staffordshire, and it was reported that a band of colliers was marching on Derby. At Leicester three troops of dragoons were required to quell the disturbance and several rioters were apprehended and sentenced to death.³ At Nottingham on August. 25 a large body of colliers and others, armed with hatchets and picks, entered the town, "shouting and making a

¹ *S. P. Dom. Geo. II.* (1756), 135/69, 135/70.

² *Ibid.* 135/76, 135/77.

³ A letter was sent to the Secretary of State expressing appreciation of "the great and just spirit of my Lord Chief Justice Willis, for several of the Rioters were taken to Warwick Gaol on Friday, convicted on Saturday, and ordered to be executed on Monday" (*ibid.* 135/66).

great noise". After the Riot Act had been read, three of them from Lord Middleton's mines at Wollaton were arrested, but, under threat of having the Town Hall pulled down over their heads, the Mayor and Aldermen were forced to release them. The rioters then destroyed French grindstones in a corn-mill, and before the following morning eight or ten windmills in the neighbourhood of the town had been demolished.¹

On August 30 troops came to the aid of the harassed townsfolk and the Mayor was able to arrest one of the three colliers who had been released five days earlier, together with three other ringleaders of Lord Middleton's colliers, "behaving with great Insolence, stout fellows in Appearance and daring to nose me with the name of their Noble Lord". On September 7, when the colliers again marched on Nottingham to rescue their comrades, they were met on the outskirts of the town by a force of cavalry, and it was only, apparently, the tact of the Colonel in command that prevented a pitched battle.² Gradually the storm calmed down, but the civic authorities were far from easy in mind: no reliance, declared the Mayor, could be placed in the gentry of the neighbourhood for they were terrorised by the colliers ("Ther's a prevailing Effeminacy among our Country-Gentlemen. They would make bad Captains over a Militia".) and a request was therefore made for a garrison during the winter.³

In the later months of this year, and the early months of 1757, outbursts of temper on the part of distressed workers occurred in all parts of the country; and there were riots at York, Boston, Ely, Cambridge, Oxford, Hereford, Newcastle-under-Lyme, Liverpool, Manchester and other centres of population.⁴ In November the colliers from Broseley, Madeley Wood, and Bontale in Shropshire marched with the bargemen of the Severn

¹ *S. P. Dom. Geo. II.* (1756), 135/65, 135/68.

² *Ibid.* 135/75.

³ *Ibid.* 136/17.

⁴ *Ibid.* (1757), Bundle 178, *passim*.

to procure corn from Wenlock Market, and, despite the efforts of their master, Brooke Forester, the colliers of Dawley and Oaken Gates joined the rioters at Shifnal, where private houses and the shops of cheese-factors were looted.¹ In December there was rioting at Berwick, and serious fighting occurred between the mob and a party of Invalids who were stationed in the town.² In January colliers of Caermarthenshire forced their way into Langbourne and rifled a storehouse, but they were routed by a body of townsfolk and neighbouring gentry; and when, four months later, a raid was made by colliers and bargemen upon the town of Caermarthen, the rioters were met by troops and five of them were killed. In Somerset attacks were made on several mills near Frome by a body of 200 colliers; and at one place two of the rioters were shot by a mill-owner, who managed to defend his property till two companies of soldiers came to his relief.³

With the prohibition of exportation of grain in 1757 and the better harvests of 1758 discontent died down, and during the remainder of the war the crops were definitely good. In March 1761, it is true, some thousands of pitmen came into conflict with the militia at Hexham in Northumberland and over a hundred were killed and wounded; but this was a revolt against the operation of the Militia Act and had no economic motive.⁴ Though in 1764 prices began to move upward once more no serious disorders are recorded until after the end of 1765.

This year, according to Tooke,⁵ marks the opening of a new era: the half-century of relatively low prices and excess of grain exports was followed by a half-century of high, and generally rising, prices, with a normal balance of imports of grain. And, whereas in the earlier period corn riots had been epidemic, in the later

¹ *S. P. Dom. Geo. II.* (1756), 136/25, 137/19.

² *Ibid.* 136/44.

³ *Gentleman's Magazine* (1757), 90, 185, 285-6, 430.

⁴ *Annual Register*, iv. 82, 83.

⁵ *Op. cit.* 62.

period they became almost endemic. To ascertain the details of all the uprisings of the poor during these fifty years would involve labour disproportionate to the value of any generalisation that would be likely to emerge; and the reiteration of the futile story of attacks on corn-mills and the forcible unloading of grain vessels would weary the reader. All that will be attempted, therefore, is to enumerate the years of dearth between 1765 and the end of the eighteenth century, and to mention the coalfields in which disturbances occurred.

In 1765 there was a prolonged strike of the pitmen of the Tyne, but as this was part of an industrial dispute, and not the result of a shortage of food, it has been considered elsewhere.¹ In the following two years, however, faulty harvests produced an authentic hunger storm which swept the country from Berwick to Exeter. In Warwickshire the colliers once more descended on Coventry, and those from the tiny coalfield of Clee Hill raided Ludlow and pulled down a still-house there.² During 1768 there were violent riots of sailors and coal-heavers in London; and at Shields and Sunderland sailors and keelmen made a "stick" for higher wages, in the course of which attacks were made on the provision dealers.³ Although the crops of 1768 and 1769 appear to have been normal they were followed by a succession of five poor harvests from 1770 to 1774 with "consequent commotions among the people and uneasiness on the part of government".⁴ To what extent, if any, the colliers were involved in these disturbances we have no clear information, but it is possible that the dearness of grain played some causative part in the Sheffield riots of 1774—directed primarily against the high price of coal—as well as in the riots at Nottingham, of the same year, and the strike of sailors at Shields and Sunderland⁵ in 1775.

¹ *Supra*, 89-91. ² *Gentleman's Magazine* (1766), 67, 124, 135, 137, 167.

³ *Annual Register* (1768); *Gentleman's Magazine* (1768), 298-9, 347.

⁴ Tooke, *op. cit.* 68.

⁵ *Bell Coll., Guard Book*, vii. 79; *Annual Register* (1774); *Ibid.* (1775), 100.

The harvests of the late seventeen-seventies were good, but in 1780 and 1781 there was a marked upward movement of prices, culminating after the wretched crops of 1782, in the peak of 1783. In March of that year "a dangerous disposition" to riot developed at Newcastle-under-Lyme, and in the following month the Clee Hill colliers were in conflict with the troops at Ludlow.¹ Between this time and the beginning of 1789 plenty and peace went hand in hand. But 1789 itself was one of the darkest years of the century. The winter had been marked by one of the severest frosts on record—in January the Thames was frozen over—and the spring was backward and the crops deficient. Between Michaelmas 1788 and Michaelmas 1789 the price of wheat increased from 48s. to 57s., and the rise would probably have continued but for an Order in Council of December 1789 which prohibited exportation and permitted the importation of grain duty free.² As usual, however, this measure was not taken until after grave disturbances had broken out. In March a strike of the pitmen on the Tyne was marked by exceptional violence. At Long Benton Colliery a mob of 200 men destroyed several engines and set one of the pits on fire; at Shire Moor, Wallsend, and East Benton Collieries machinery was smashed; and at Walker and Gosforth Collieries lighted lamps were thrown into the pits.³ Action of this sort implies a wage-earner's rather than a consumer's grievance, but it is not improbable that the upward trend of food prices intensified the animosity. Be that as it may, the riots that developed in other parts of the country during the summer of the same year were, without doubt, the outcome of a shortage of food.

In the district stretching from Holywell to Oswestry thousands of colliers were out in search of bread. At Denbigh waggons were stopped, boats were destroyed, and "gentlemen of the first rank" were "insolently

¹ *H. O. Papers*, 40, 42, 2. We are indebted to Miss Mabel Phythian for this reference.

² Tooke, *op. cit.* 80.

³ *Bell Coll.* xx. 5.

called upon, in the most public manner, to lower their rents or take the consequences". There were even rumours of an attempt to seize the arms of the militia. The riots were evidently serious, for, three months after these incidents, troops of dragoons were sent from Manchester to Wrexham.¹

In the spring of 1792 there were disturbances at Birmingham, Leicester, and York; and at Liverpool the carpenters and masters of the coal fleets were on strike for higher wages.² A wet summer intensified the trouble, and between July and December outbreaks occurred at Newcastle, Sheffield, and Coventry. At Rothwell Haigh, near Wakefield, the colliers ceased work in October;³ during the winter the pitmen and keelmen of the Tyne and Wear were out for several months;⁴ and in June 1793 thousands of colliers and nail-makers about Dudley and Stourbridge were on strike against a reduction of wages.⁵

Since February of this year Britain had been at war with France, and from this point it is impossible to disentangle the effects of crop shortage from those of war-time restrictions and currency inflation. A deficient harvest in 1794 appears, however, to have been the principal cause of a sharp rise in the price of bread during the following year: whereas on January 1, 1795, wheat stood at 55s. 7d., in August it reached 108s. 4d.; and in spite of special bounties on importations, and drastic measures of voluntary rationing by the middle classes, once more there was hunger among the workers.⁶

On October 29, a London mob surrounded the King's carriage, calling out for "Bread and Peace".⁷ In many places—notably in Durham and Shropshire—the employers purchased immunity from riots by the dubious policy of selling grain to the colliers below the

¹ *H. O. Dom. Entry Book* 43, No. 3, pp. 70, 75.

² *Ibid.*

³ *Sheffield Advertiser*, October 19, 1792.

⁴ *Sheffield Register* (1793), February 8.

⁵ *H. O. Dom. Entry Book* 43, No. 4, p. 254; *Gentleman's Magazine* (1793), 570.

⁶ Tooke, *op. cit.* 181-2.

⁷ *Annual Register* (1795), 38.

market price. But in the Forest of Dean, where there were no large employers to dispense charity, the miners rose and helped themselves to quantities of Government wheat and barley which were in transit to other parts of the country.¹

During the next two years prices were moderate, but the winter of 1798-99 was severe and the succeeding summer wet, so that there was again a deficiency in the harvest, estimated by Arthur Young at 36 per cent.² At the end of the year wheat sold at 94s., by the following June it had reached 135s. 5d., and a second wet season and the imposition of the Russian embargo brought it to the truly famine price of 156s.³ The inevitable response in rioting began in April 1800 at Stafford, where the dragoons were called out and no fewer than 47 colliers were arrested. At the same time tumults broke out in Nottingham, Sheffield, and Leeds;⁴ and in September attacks were made on Quaker mealmen and corn-factors in London.⁵ During the following winter rioting was widespread, and among the colliery districts where the trouble was sufficiently serious to be brought to the notice of the Home Office were Wigan, Stafford, the Potteries, Nuneaton, Bristol, and that centre of so many storms in later generations, Merthyr Tydfil.⁶

If it were thought desirable to carry the melancholy story into the nineteenth century the social struggles of 1809-13 and 1817 (which were obviously the result of dearth) would provide many instances of the use by the colliers of forceful measures in defence of threatened standards of life. The association of dear food and civil tumult did not cease, indeed, until revolutionary changes had taken place in methods of transport, until restrictive

¹ H. G. Nicholls, *The Forest of Dean*, 84. For the supply of rye below cost price in the North, see *Report on the Coal Trade (1800)*, App. 559, ev. Thomas Ismay; for the same practice in Shropshire, see Rathbone, *Letters of Richard Reynolds*.

² *Annual Register* (1800), 7.

³ Tooke, *op. cit.* 224.

⁴ *H. O. Dom. Entry Book* 43, No. 11, 469.

⁵ *Annual Register*.

⁶ *H. O. Dom. Entry Book* 43, No. 12, *passim*.

duties on imports had been repealed, and until men in distant parts of the earth had learnt that it was profitable to grow wheat for the workshop of the world.

In the riots of the eighteenth century all classes of wage-earners participated—weavers, frame-work knitters, smiths, iron-smelters, sailors, agricultural labourers, and so on. But it can hardly be doubted that the colliers were the most active of the insurgents, and it may not be superfluous to ask why this should have been so. The reason was certainly not that they were less loyal than other workers. From time to time, it is true, excited Justices in the disturbed areas alleged that the colliers harboured sinister designs against the State—that they favoured the Pretender, or that they were Levellers—but no one of them ever presented evidence in support of the charge. The coal-miners frequently professed their attachment to the Crown and the Royal Family; and some of them proved it in 1789 (when the freezing of the Thames brought a fuel famine to London) by travelling for eleven days over a distance of 111 miles from Loughborough to London, with a waggon-load of coal for the use of the Prince of Wales at Carlton House.¹ Few of them had political instincts at all: with the exception of a small group in Durham, they took no part in the early agitation for Reform. And, if many a coal magnate owed his victory in the rough-and-tumble of the political contest to the presence about the hustings of his unenfranchised pitmen, it was personal goodwill and not political principle that had brought them there.² Those of the colliers who held political views of their own were probably, like the coal-heavers of Wapping, strong Church-and-State men—at least in the easy days before the Methodist Revival brought a new seriousness to politics as well as to religion.

¹ *Annual Register* (1789).

² See *S. P. Dom. Geo. II.* (1756), 135/75. "These colliers are always let loose to support the Freedom of Elections, and therefore now all the (Tory) Party are desirous to have the Colliers now in prison rescued".

The turbulence of the colliers is, of course, to be accounted for by something more elementary than politics: it was the instinctive reaction of virility to hunger. Life underground had bred in them a contempt of danger, and if they held their own lives cheap they were hardly likely to set an exaggerated value on those of others. Moreover, the conditions of their daily work imposed on them a discipline and co-operation that could hardly be looked for in the weavers and framework knitters of domestic industry. When they set out for bread they marched under captains (possibly their overmen or charter-masters) and when they were forced to retire they found in the pits themselves places of refuge from their pursuers.

Furthermore, the provocation was probably greater in the colliery areas than elsewhere, for the means of distributing foodstuffs were undeveloped, and it was only with difficulty that temporary shortages could be made good. The paucity of dealers and shopkeepers in mining villages was a matter of comment as late as the middle of the nineteenth century: it was at once a cause and a consequence of the prevalence of the truck system. And it meant that when the granaries of Bristol failed to supply the Kingswood colliers, or those of Coventry the miners of Warwickshire, there was no one to explain the true reason, there was no middle-class opinion to sober the counsels of hungry men.

In the riots of the early part of the century the colliers generally remained on good terms with their employers and neighbours. In the disturbance of 1727 the Justices of Gloucester complained of the favour which "the Country" extended to the rioters.¹ In those of 1740 in Flint and Denbigh some of Sir Thomas Mostyn's colliers bore his emblems as their uniform and called out "A Mostyn!" when they marched into the towns. And some of Sir Thomas's fellow Justices protested—whether rightly or not cannot be deter-

¹ *S. P. Dom. Entry Book* 125, p. 177.

mined—that he did not exert himself as he might have done in rounding up and punishing the rebels.¹ Yet again in 1756, as has been seen, the colliers who had been arrested in the riots at Nottingham sought shelter behind the name of their employer, the great coal-owner Lord Middleton.²

In the later part of the century a more modern tone appears in the demonstrations. Demands are made not only on the corn-factors for lower prices, but also on the employers for higher wages; and at the end of our period so frequent and destructive are the attacks on colliery property that a special Act of Parliament is passed in 1800 to punish sabotage.³ Concerted action for industrial ends was no new thing to the coal-miners. There were combinations of colliers in Ireland before 1755, and minatory letters with fictitious names attached, in the best nineteenth-century tradition, were sometimes sent to the employers.⁴ When lifelong servitude was abolished in Scotland a special clause in the Act of 1775 imposed a further period of two years' bondage on colliers guilty of unlawful combination.⁵ But a writer of 1808 asserts that there were strong unions among the Scottish colliers, and that these included women as well as men.⁶ The struggles concerning the yearly bond in Northumberland and Durham in 1765 imply at least a temporary union here, and the statement of the employers that the colliers had combined for higher wages and left the pits idle at Middleton Colliery in 1786 proves the existence of "confederacies" in Yorkshire.⁷ Whether any of the "brotherings" to which Macnab⁸ referred in 1800 emerged from the rudimentary organisation that outsiders were able to discern among the rioters who form the subject of this chapter it is impossible to say. On the whole, it

¹ *S. P. Dom. Geo. II.* (1740), 51/29.

² *Ibid.* (1756), 135/75.

³ 39 and 40 Geo. III. c. 77.

⁴ H. G. Graves in *Trans. Inst. Min. Engrs.* xiv. 188.

⁵ 15 Geo. III. c. 28, s. 9.

⁶ Bald, *op. cit.* 143.

⁷ *Leeds Mercury*, January 2, 1787.

⁸ *Letter to a Noble Lord*, 39.

seems more likely that the early unions would take their origin in the sick and burial clubs that were beginning to appear in the colliery villages towards the end of the century, for in other trades the sheepskin of the friendly society often served as a cloak for illegal designs. In face of the Common Law against conspiracy and of special legislation against combination, such societies would hardly keep records of any industrial objects they might cherish, and neither colliery day books nor Home Office papers throw even a glimmer of light on the problem. Of the forces of disruption and their manifestations in riot and tumult there is abundant evidence. But when we look for the constructive agencies by which the workers may have sought to build up their social standards the twilight of history gives place to almost complete darkness. For the student of labour organisation in the coal industry the eighteenth century belongs, indeed, to pre-history.¹

¹ Writing in 1800, W. Thomas refers to the sick and burial clubs of the collieries of Northumberland and Durham (*Letter to Sir John Swinburne*). In 1797 a Liberal Coal Trade Association was formed at Newcastle with friendly society objects, but as the rules of membership required a minimum yearly income of £40, it was probably a society of overmen and viewers rather than of pitmen. The rules of a Miners' Benefit Society founded in 1812 are printed in *Tracts on the Coal Trade*, in the library of the North of England Institute of Mining Engineers, Newcastle, No. 3842.

CHAPTER IX

WAGES AND CONDITIONS OF WORK

At his day thou shalt give him his hire, neither shall the sun go down upon it; for he is poor, and setteth his heart upon it.

DEUT. xxiv. 15.

I

THE practice in most of the English coalfields of paying labour collectively makes it exceedingly difficult to trace the course of earnings. And even where individual colliers were paid directly the records are concerned not with the amount earned per day or per week, but with the rate paid per score of corves of coal hewn and drawn to the surface, or the rate per yard of level driven underground. Since these must obviously vary with geological features, a comparison of rates between one colliery and another, or between one period and another, tells us nothing as to the real reward of effort. For this we must rely on the statements of observers of the colliery population, and on those entries in colliery day books which refer to the earnings of what are now termed "datallers"—men engaged in repairing roads and in other dead-work. Piece-workers would probably make somewhat more than these.

According to *The Compleat Collier*, at the opening of the eighteenth century the day-rate for hewers and sinkers in Durham was 12 or 14 pence.¹ At Gatherick in Northumberland earnings seem to have been only 7½d. a day.² But this was probably an unduly low wage. At Pontefract in 1703 the Justices fixed the maximum for colliers at 12d. a day,³ and at Shibden Hall, near

¹ P. 29.

² Bulman and Redmayne, *Colliery Working and Management*, 41.

³ *V.C.H. Yorks.*

Halifax, the actual earnings were 10d. to a shilling.¹ In 1709 hewers at Whitehaven² made 10d., and about the same time miners' wages in Scotland seem to have been 1s. 2d. a day.³ In the English Midlands, however, they were at a somewhat higher level. The records of the Newdigate family give plentiful evidence of a normal rate for hewers in 1701 of 18d. a day at Griff Colliery in Warwickshire. Probably we shall not be far out if we put colliers' earnings generally at between 12d. and 18d. during the early years of the century.

Changes in rates occurred but rarely. At Shibden Hall in 1723 getters and winders together had 1s. 8½d. a day, which would mean that the getter had probably about the same wage as in 1714.⁴ According to a modern writer⁵ wages in Northumberland and Durham increased 30 per cent following a rise in the price of coal in 1739; and, according to another, pitmen in 1740 earned from 1s. 6d. to 1s. 10d. a day.⁶ Support is given to the statement by the rates paid at Lumley Main and Byker Main in 1745. At the former the hewer obtained 1s. 9d., and at the latter 1s. 6d., for a standard output—presumably the recognised daily "stint".⁷ It is possible, however, that the increase was not retained, for in 1751 sinkers at Benton Colliery had only 1s. 3d. and 1s. 4d. a day; and a collier of ninety-three, who began work at the age of six or seven, informed J. R. Leitchfield in 1841 that when he was a "foal" hewers at Morpeth obtained only 1s. 4d. a day.⁸

Illustrating his thesis that slave labour is dear and free labour cheap, Adam Smith put the wages paid on the Tyne in the 'sixties at a still lower level.⁹ If the Scottish colliers were free, the argument ran, the price

¹ Wheater, *Old Yorkshire*, 280.

² Galloway, *Annals*, 218.

³ Bald, *General View of the Coal Trade*, 16.

⁴ Wheater, *loc. cit.*

⁵ Welbourne, *Miners' Unions*, 14.

⁶ *Trans. N. of Eng. Min. Engrs.* xv. 205.

⁷ Bulman and Redmayne, *op. cit.* 43.

⁸ *Child. Empl. Comm. App.* (1842), 574.

⁹ *Lectures of Adam Smith* (ed. Cannan), 99. Cited Galloway, 283.

of their labour would fall: "At Newcastle the wages exceed not tenpence or a shilling, yet colliers often leave our coal-works, where they have half-a-crown a day, and run there, though they have less wages, where they have liberty". Coming as he did from Kirkcaldy, Adam Smith would know what he was talking about when on the topic of collier slavery. But, if he was correctly reported, it would seem that he was misinformed as to the wages of colliers in England. The Lectures from which the passage is taken were almost certainly delivered in the session 1762-63 or 1763-64. It is to be regretted that we have no colliery books of the Newcastle area for these years. But it has been shown that some years earlier earnings were certainly higher; and the estimates of contemporaries suggest a rise rather than a fall during the early 'sixties. When M. Jars visited Durham in 1765 he recorded the average earnings at Walker Colliery as 2s. to 2s. 6d. a day.¹ And in the same year the *Gentleman's Magazine*² stated the earnings of Tyneside colliers as between 12s. and 14s. a week. Though one would expect the *Gentleman's Magazine* to put a good complexion on affairs at a time when the colliers were on strike for higher earnings, it was almost certainly nearer the mark than Adam Smith. Another Scot, who, six years later, estimated the earnings of the Newcastle collier at 9s. a week, perhaps hit the right figure.³

For other parts of England we are fortunate to have the unbiassed evidence of colliery documents. A manuscript in one of Sir Roger Bradshaigh's coal books at Haigh shows that in 1758 the Wigan collier was paid 10d. a load, and that when he obtained twelve loads in a week he received a bonus of sixpence.⁴ The amount set down as a sample week's earnings is 10s. 10d., allow-

¹ Galloway, *op. cit.* 283.

² P. 430.

³ John Miller, *Origin of Ranks*, 289-90. Cited *Edin. Rev.* vol. 189, 145. In the Barnsley area wages varied between 7s. and 9s. a week in 1770. *Vide* Hoyle, *History of Barnsley*, 102.

⁴ Haigh MSS.

ing 4d. for odd baskets. If the collier worked six days a week, he would thus make about 1s. 10d. a day. The colliery book of John Barnes for the pits at Barlow in Derbyshire show a normal day-wage for hewers between 1764 and 1776 of 1s. 6d., and the same rate was paid for driving underground ways.¹ And a Day Book of the Duke of Bridgewater² gives evidence of a regular payment of 1s. 8d. a day to men engaged in tunnelling and similar work in 1769 at Worsley. Probably at both Barlow and Worsley the coal-getters would make somewhat more when paid, as they usually were, by the piece.

It must be admitted that the data so far presented will not bear any weighty generalisation. It is remarkable, however, that wages in Lancashire and Derbyshire in the 'sixties should be virtually the same as those paid in Warwickshire at the opening of the century. This rigidity of wages can be illustrated, over shorter periods, from the records of individual collieries. As already observed, 1s. 6d. was the normal day-wage at Griff in 1729, as in 1701. At Barlow 1s. 6d. was the regular day-wage each year between 1763 and 1776. And at Coalbrookdale 5s. 3d. a waggon-load was paid to the charter-master alike in 1768 and 1780.³

From the outbreak of the American War wage-rates became more flexible, and from 1775 to 1815 the general movement was upward. Between 1776 and the close of the record in 1779 there is a distinct tendency for the rate at Barlow to rise from 1s. 6d. to 1s. 8d. a day. A few years later an American observer remarked that each Lancashire collier produced about a ton a day, and added that the miners' wages were 2s., and the labourer's about 1s.⁴ By the middle of the 'eighties the upward swing was marked. In 1786 the average wage at Pontop Pike Colliery was 1s. 9d. a day for hewers.⁵

¹ In the possession of Edwin Barnes, Esq., of Ashgate.

² *Matthew Shelvocke's First Day Book*, 1769.

³ *Waste Books, Coalbrookdale MSS.*

⁴ *V.C.H. Lancashire*, 358.

⁵ Bulman and Redmayne, *op. cit.* 37.

In 1787 at Middleton Colliery near Leeds¹ earnings varied between 2s. 6d. and 3s. a day, and none, it was stated, got less than 2s. At Wigan in the same year 2s. 6d. a day was paid for driving levels.² And in the same year again the Staffordshire colliers were on strike for an advance to 3s. a day, though it appears unlikely that they were successful.³ When the Butterly records begin in 1790 they show a day-wage for sinkers of 2s. 2d., and in the following year at one pit eight sinkers received 2s. 3d., three 2s., and eight 1s. 6d., while five labourers got 2s. a day each.⁴ In 1795 wages of underground workers here were 2s. 4d. and 2s. 6d., and in 1796 at Ebbw Vale in South Wales day-work men received sums varying from 1s. 7d. to 2s. 6d., with the norm at 2s. Piece-work earnings would almost certainly be higher.⁵ During the last decade of the century an increase of 33 per cent was obtained by the pitmen in the north of England, for whereas about 1790 the standard price for hewing a Newcastle chaldron was 1s. 6d., in 1800 it was 2s.

This increase was, of course, part of the general rise of prices resulting from war and currency inflation. But there were also special forces operating on miners' wages. It was the period when the full fruits of inland navigation were being reaped, and new demands for coal were coming from districts which had previously hardly known the sight of it. Above all it was the period following Henry Cort's revolutionary changes in the technique of iron production. In Scotland, in Cumberland, in Yorkshire, Derbyshire, Staffordshire, Shropshire, and South Wales new furnaces were being constructed with almost feverish haste;⁶ and each meant a substantial increase in the demand for coal. The iron-

¹ *Leeds Mercury*, January 2, 1787. Cutting in *Bell Coll.*

² *Haigh MSS.*

³ Letter of James Watt to Matthew Boulton, October 11, 1787. Birmingham Reference Library.

⁴ *Butterly Cash Book*, 1790-96.

⁵ *Ebbw Vale MSS.*

⁶ *Report of Committee on Coal Trade* (1800), 647.

works and foundries of Carron and Clyde, it was said in 1793, "alone consume as many coals as all the inhabitants of Edinburgh".¹ For the country as a whole the increase in demand must have been prodigious.

At Howgill Colliery in Cumberland in 1800 daily wages were about 3s.: of seven colliers who worked an average of just under five shifts in one week six obtained between 14s. and 14s. 6d., and one 12s.² In 1802 at the pits of the Tredegar Company in South Wales 2s. 6d. was the regular day-wage for colliers, and, no doubt, getters would obtain more.³ The following year at Bowling in Yorkshire the getter and hurrier jointly received 3s. 11d. a day, which was divided between them in the proportions of two to one;⁴ and a little later at Rothwell Haigh Colliery the regular daily wage for a getter and his lad working together came to 3s.⁵

To the colliery proprietors and their friends these rates appeared exorbitant. "The wages of an ordinary collier, at most works, is better than the pay of a lieutenant in the army", quoted Dr. Macnab in 1801, and from all fields, with one exception, there was a cry of shortage of labour. "Miners are so exceedingly scarce, and their wages so extravagantly high", says the same authority, "as to enable them in general to live upon the wages of the labour of two-thirds of their time, and . . . the remaining third is spent in idleness and dissipation".⁶ The exception was the Northumberland and Durham coalfield, which was said to be "well-peopled". It is significant that this was the one large colliery area which, since its coal was unsuitable to smelting, was not being covered with ironworks.

Yet even in the north of England earnings rose

¹ *Letter to a Noble Lord.*

² *Accounts of Howgill Colliery, Watson Coll.*

³ *Tredegar Company's MSS.*

⁴ Cudworth, *History of Bolton and Bowling*, 239.

⁵ *Rothwell MSS.*

⁶ H. G. Macnab, *Letter to John Whitmore* (1801), 43, 51.

rapidly in the early years of the new century. The steam-engines of Watt and Trevithick and numerous other minor inventors intensified the demand for Newcastle coal no less than for that of other areas. In the year 1800, according to the statement of a well-informed observer,¹ the Newcastle collier made 2s. 6d. to 3s. a day, or 16s. a week. In 1805 a substantial advance took place not only in the rates of pay, but also in the hiring money paid on binding; and from every side came complaints of a shortage of pitmen. Consciousness of economic strength is instinct in every line of the following document, euphemistically headed "Petition of Pitmen, 1805":²

"To the gentlemen of Heaton Colliery We are all agreed to this petition to have 6s. a score for 24 peck Corfe, winen Headway 2s. per year, walds 1s. 10d. per year, Narrow bord 1s. 8d. per year, for Ramel 6d. per day, dubel working 6d. per day, wet working 6d. per day either a Bove head or under foot, under the top 6d. per day, and for men to have 10s. per week Smart money, and have notting to do with puting or driving, for lades 2s. per day driving, for waggons driving 1s. 6d. per day, for trappers 1s. per day, for a trame 4s. 6d. per day and lads 5s. per week smart money, and our money paid every week, and we mean to have our house and fire free and to have a Surgan and bonesetter to be paid by the gentlemen and have smith to do picks 1s. for chicking and laing 4d., all men mean to have a chance of Boreing Cole, and all that is going, and for the Broken 5 per score 24 peack Corf".

"Smart money" was compensation paid in illness, and the demand for 10s. a week for men and 5s. for boys indicates an anticipated weekly wage for those in health and work of a very much larger sum. If drivers were to have 2s. a day and even the infant trappers 1s., hewers would surely expect to earn 3s. 6d. or 4s.

¹ MS. *Summary of condition . . . of pitmen on the Tyne in 1800*, by W. Thomas of Denton Hall to Sir John Swinburne.

² *Watson Coll.*

In 1809 at Jarrow wastemen obtained £1 a week, and even screeners and banksmen 2s. a shift. By the bond of 1812 the employers guaranteed their hewers 2s. 6d. a day even if the pit were idle, and it may be presumed that actual earnings were well above this minimum. In 1813 they were said to be 3s. 4d. In Yorkshire at Rothwell 3s. 2d. was the reward of a good day's work in 1812.¹ Two years later at Ebbw Vale in South Wales datallers had 3s., an advance of 50 per cent on the wages of 1796. Piece-workers must have earned considerably more.

The figures are too scanty to allow of any close correlation with prices of commodities. But if we can put the general wage in 1780 at 1s. 8d., as it undoubtedly was at Barlow, and the general wage in 1813 at 3s. 4d., as it was in Durham, we can say that wages had more than kept pace with prices, but had advanced slightly less than the cost of living, as expressed in the recently constructed index-numbers of Dr. Silberling.²

II

When payment was made, the sum handed over did not necessarily correspond with the actual earnings since the previous pay. There is evidence from coal-fields as far apart as Durham and Glamorgan that the collier entered his term of engagement in debt to his master; and domestic incidents, like death or the birth of a child, often drew men into deeper indebtedness.³

Again, there were subtractions for coal and rent, for candles and gunpowder and for the sharpening of tools. More important still were the fines for neglect, for defective work, or for absence from the colliery: the Duke of Bridgewater, for example, levied a fine of half-a-

¹ Batty, *History of Rothwell*, 187.

² "British Prices and Business Cycles, 1779-1850", *Review of Economic Statistics*, October 1923.

³ E.g. "4 Nov. 1770. By Cash lent William Berry Collr. to bury a child—10s. 6d." *Matthew Shelvoke's Day Book*, No. 2, 1770, *Bridgewater MSS.*

crown on every man who did not present himself for work on Monday morning.¹ Further deductions were made for intermixture of stone or slack in the round coal—a source of perennial grievance to the pitmen of the Tyne and Wear. But it was not only for such offences that the miner suffered. In Northumberland and Durham he might be fined half-a-guinea for keeping swine, 5s. for a donkey or a cow, 18d. for a dog, 6d. each for pigeons, and so on.²

Almost any departure from routine operations was marked by the provision of ale and sometimes of food. In a heavy frost in the winter of 1770–71, bread, cheese, and ale were supplied to colliers who worked all night at the Bridgewater pits.³ And at Barlow ale was a common solatium for work in wet or inconvenient places. Compensation for work of special difficulty was, however, generally made in money. The payment of 2d. a day “to mend wages” was common at Griff in the early years of the century; and in the Bridgewater records of the seventeen-sixties the same allowance is frequently found. For example:

3 Nov. 1766. Paid Jn^o. Newton for 24 weeks and $3\frac{3}{4}$ days £ s. d.
work being an additional allowance of 2d. p day . 1 4 7½

Bounties were paid, moreover, for regularity of work and output. The payment of a premium of 6d. when a certain weekly output was reached at the Haigh Colliery of Sir Roger Bradshaigh has already been mentioned. In 1816 at Rothwell in Yorkshire the employer gave an extra sum of 4s., known as “takking brass”, as an inducement to work a full week of six days;⁴ and in a Lothian colliery bond of 1827 the workers agree to forfeit the bounty if they do not fulfil the conditions laid down.⁵

¹ Smiles, *Life of Brindley*, chap. v. 231.

² *A Candid Appeal to the Coal Owners and Viewers* (1826).

³ *Matthew Shelwocke's Day Book*, March 4, 1771.

⁴ Batty, *History of Rothwell*, 187.

⁵ Cunningham, *Mining in Mid and East Lothian*, 40.

A very common arrangement was that whereby the employer paid to the workers each week or fortnight a "subsistence" which did not bear any necessary relation to the earnings of the period; at intervals the account of each man was reckoned and the balance handed over. The system was in operation at Griff in Warwickshire at the beginning of the eighteenth century. Its existence about the same time in South Wales is shown by a letter in which the cutters and drivers of Sir Thomas Mansel's collieries at Briton Ferry and Baglan, complaining of the competition of the collieries near Berry, informed their employer "that ye Subsistence we have weekly receiv'd of your agent John Burrough much exceeds ye Coal shipt whereby we are and have bin consid'ble Debtors unto your Hon'ble throughout ye Late Winter".¹ And more than a hundred years later, on November 6, 1826, a letter from John Grey written from Hartsheath Park proves the existence of the same practice:² "You will please to allow the subsistence as usual as the men have paid us all arrears . . . the subsistence is to be 5s. per week to each person". The advantage of the arrangement at Culross, where a subsistence was paid each fortnight, and the balance of earnings once in every three or four months, is set forth in a pamphlet³ of 1793: "This mode of paying them made them economical, and the arrears enabled them to provide themselves with good clothes, household furniture, etc. and to lay in a supply of beef for their families in November". On the other hand, by providing a minimum below which the weekly income could not fall, when the worker was in employment, it constituted a guarantee against undue fluctuations in the standard of comfort—a guarantee reinforced by the "upstanding wage", paid in the Great Northern Coalfield to the bound collier even when unemployed.

¹ D. R. Phillips, *History of the Vale of Neath*, 236.

² *Watson Coll.*

³ *Description of the Estates belonging to the Earl of Dundonald at Culross* (1793), 67.

The method was of no less advantage to the employer, for under it he was able to defer part of his wages bill until such time as he found himself with sufficient ready cash. The provision of money for the wages of a large body of relatively well-paid labour can never have been an easy task, and at times of financial crisis it became one of extreme difficulty. In the stringency that marked the outbreak of war with France in 1793 the proprietor of Hasland Colliery in Derbyshire was forced to procure coin of small denomination from local tradespeople. On January 28, for example, one E. Bawn advanced £20 in silver and copper to Richard Clay, the manager of the colliery; and on July 20, £12:5s. was provided, of which £2:10s. was in halfpence. On January 9 of the following year no less than £139 was paid to George Taylor, a Chandler and oilman, for halfpence supplied to the colliery, and at the restriction crisis of 1797 Taylor advanced £200 in the same small change. It seems possible that halfpence were the only form of currency available.¹

The proprietor of this colliery, John Broxupp, also owned a farm, and it was but natural that some of the produce should find its way to the men engaged in the coal-works. On May 29, 1798, for example, a Richard Ashley received five quarters of wheat, valued at £5, as payment for the carriage of coke. In the following year the manager, Richard Clay, was debited with several sums for "beef to colliers", obviously supplied from Broxupp's farm. It appears likely that some of the colliers with families would lay down supplies of meat for the winter out of their autumn wages. For between September 18 and November 27, 1793, no less than £53:2:5, and between September 17 and December 7, 1794, £66:2s. was paid to them in the form of beef. From 1799 onward substantial sums were given to Elias Elliott, Richard Clay's successor, for "housekeeping"—£100 on December 23, 1800, £500 on April 11,

¹ *Hasland Colliery Book.*

1803, £567:9:4 on July 23, 1804, and so on. For the year 1806, £657 was paid in all under this head, and each year thereafter sums of a like magnitude. It is impossible to give a meaning to the work "housekeeping", but since Elliott's own earnings were only £25 a year, some form of payment in kind to the workers seems to be indicated. From 1805 Broxupp began the purchase from neighbouring farmers of barren cows: in this year ten were purchased, in 1807 sixteen, in 1808 fifteen; and though no further reference is made to them, it seems not unlikely that the cattle were bought as food for the colliers.

On the Tyne and Wear rye was the staple diet of the colliery population. In an estimate of the cost of getting a chaldron of coal at Chapple Colliery in 1796, the sum of 8½d. is deducted from the gross expenses on account of rye for the workmen, who evidently paid for it by a stoppage from wages; and in 1800, when the price of rye was 11s. a quarter, employers on the Tyne commonly supplied it to their colliers at 5s.¹

Provision of food from a farm attached to the colliery and sale of grain below market price were surely harmless, if not actually beneficial to the miners. But in some places the provision of commodities by the employer became a serious social evil. Before 1662 the pitmen of Newcastle had sometimes been forced to accept their wages in the form of corn,² and in 1765 it was found necessary to protect the coal-miners of Ireland by prohibiting payment in coal.³ The author of a pamphlet written in 1793 denounces "the dirty and mean practice" of Scottish owners who acted as sutlers, and not only made a direct profit by selling household commodities to the colliers at advanced prices, but also took a share of the gain on the beer and whisky sold by the overmen to the miners.⁴ In the north of England also

¹ *Report on the Coal Trade* (1800), 559.

² Welbourne, *The Miners' Unions*, 4.

³ *Trans. Inst. Min. Engrs.* xiv. 188.

⁴ *Description of the Estates . . . at Culross*, 55.

the same evil existed. "It is not unusual for Lessees of Mines to be concerned in Breweries", wrote W. Thomas in 1800, "and to have Public-houses taken attached to the Colliery which they make their pay houses, and frequently the inferior Agents such as Overmen, etc. keep Ale houses and retail shops where the Pitman is often obliged to purchase Articles for himself and family at exorbitant prices, merely from having involved himself in a load of debt which the Shopkeeper too frequently leads him into".

This association of debt with the truck system can be illustrated from the books of the Tredegar Company in South Wales. A typical entry in the "Rough Pay Book" of the Abercarn Mines for 1802 exhibits a collier, John Raper, in debt to the extent of a guinea for cash advanced, 4s. 4d. for clogs, £1:14:3 for beef, and £1:2:3 for sundry other commodities. Other miners were indebted for sums ranging from twopence to fifteen pounds. A "Stoppages Book" for the following year shows indebtedness of colliers for clogs, clog clasps, helves, gunpowder, baskets, oats, malt and hops, and even backstones; and sometimes charter-masters were debited with the cost of tools supplied to the men in their gangs. What proportion of the household necessities of a collier's family were received from the employer it is impossible to say. It was certainly no small one. A "Provision Shop Book" of the same colliery for the year 1821 gives the names of fifty-eight persons who owed the company an aggregate of £620. Of this one, Ann David, owed no less than £180:7:11, and a William Jones, who is specifically described as a miner, owed £132:8:2. A similar system existed at the works and collieries of the Ebbw Vale Company. In July 1814 the debts of colliers for houses, coal, oil, tools, and other commodities varied from 6d. to £242:5s. An inventory of 1824 shows that the Company's shops, which sold provisions and household necessities of all kinds, had a stock valued at no less than £2120:3:4.

The late Professor Unwin laid stress on the effect of currency difficulties in stimulating the growth of a truck system in the cotton industry.¹ Although instances can be found here and there before the outbreak of the wars with France, it can hardly be fortuitous that in none of the records used as the basis for this essay is there a sign of a truck system before the last decade of the century. Neither at Griff, nor Coalbrookdale, nor Haigh, nor Worsley, nor Barlow, nor Butterly, nor Newcastle is there evidence of any but cash payments. Like the butty system, truck developed in response to a real economic need. The two sprang up in the same soil; both were the product of a relatively early stage of capitalism; and neither, it is worth noting, ever obtained a firm hold in the large-scale mining concerns of Northumberland and Durham.² When, elsewhere, they had ceased to be necessary and had become problems, the evils of truck shop and butties were found to be inextricably intertwined. It was not, however, in the eighteenth century, but in the early and middle years of the nineteenth, that this monstrous crop of oppression and social disharmony came to harvest.

III

That in money wages the coal-miner was better off than most other workers is beyond doubt. In 1771 the Fifeshire collier made 12s. a week, against 4s. earned by the agricultural labourer, and though in England the difference was less marked, the collier had 9s. against the 6s. of the labourer.³ "A collier working by the piece is supposed, at Newcastle, to earn commonly about double, and in many parts of Scotland about three times, the wages of common labour", wrote Adam Smith in 1776,⁴ adding that these high wages "arise

¹ *Samuel Oldknow and the Arkwrights*, chap. x.

² *Report of Midland Mining Commission*, cv. Hammond, *op. cit.* 18.

³ Miller, *Origin of Ranks* (1771), 289-90. Cited *Edin. Rev.*, *loc. cit.*

⁴ *Wealth of Nations*, book i. chap. x. pt. i.

altogether from the hardship, disagreeableness and dirtiness of his work". The Newcastle collier, with 15s. a week, is, moreover, the most highly paid wage-earner in a list compiled by Arthur Young; and the Wakefield collier, with 11s., stands well above not only the agricultural labourer, but also the skilled craftsman in the textile and pottery industries.¹ At the beginning of the nineteenth century, according to the MS. of W. Thomas of Denton Hall, the northern collier would earn 16s. a week, against 9s. made by the common labourer in husbandry. And though, with the coming of the factory system, industrial wages in general increased, in the early 'forties of the nineteenth century boys in the manufactories of South Staffordshire had only a third or a half of the wages of those in the mines;² and the superiority of the miner's position in later years was acknowledged in a Lancashire song:

Collier lads gets gowd and silver,
Factory lads gets nowt but brass.

Apart from personal income there were several broad respects in which the circumstances of the collier were deemed advantageous. In an interleaved copy of *A Voice from the Coal Mines* in the Newcastle Public Reference Library a hostile critic has written: "Collier better off than other labourers because he can employ his children at 7 or 8"; and at an earlier period Mr. Thomas, in calling attention to the same equivocal advantage, pointed out that a collier with three or four sons at work might have his family income increased by twenty or thirty shillings a week.³

Again, since the collier never went short of fuel, he was exempt from many of the ills that beset his fellows in other industries. "Among the poor it is, generally, the employment of one person in a family in the winter season for three hours more or less every day to seek

¹ *Northern Tour*, iv. 471.

² *Rept. of Child Empl. Comm. (S. Staffs)*, 10.

³ Thomas, *Letter to Sir John Swinburne*.

firewood", says an author of 1769. "Labourers in the south are obliged to endure wet and cold in a very great variety of their work, and when they come home at night, poor victuals and a cool chimney corner is their general fare; they have neither time nor fire enough to dry their stockings, cloaths, etc., before the next morning, when they put them on again damp as they are; and the repetition of this hardship chills their blood, and throws them into agues". The incidence of this complaint, it was said, was eight times as heavy in Dorset as in Durham.¹ The shortage of fuel outside the areas of coal-mining became accentuated as population increased, and the enclosure of the wastes further limited supplies. Eden points out that in the South the labourers subsisted on bread and cheese with beer or tea, and that they considered themselves in a state of great comfort if they could eat meat once a week, when the hot Sunday dinner had to be cooked by the baker. In the colliery areas, not only did the working-class families make their own bread, but they were able to have hot dishes every day.²

Social distinctions are less susceptible of definition than the economic distinctions that can be exhibited in rates of wages. But it is manifest that the collier was conscious of social superiority when he was set alongside other workers. It was the custom at many collieries to hold an annual feast, the cost of which was met by the proprietor. At Worsley the beef provided for the Christmas dinner of the labourers in 1767 cost the Duke of Bridgewater 3½d. a pound, that provided for the colliers 4d.³ It is one of those trifles that throw into relief the lines of social cleavage within what is too often regarded as a homogeneous working class.

¹ *A Treatise upon Coal Mines*, 1769, anon.

² Eden, *State of the Poor*, i. 496.

³ *William Brough's Day Book*, 1768:

3 May 1768 Paid Jas Hart for Beef for Colliers 196 lbs.	£	s.	d.
at 4d. p. lb.		3	5 4
Paid Jas Hart for Beef for labourers at Christmas last			
230 lbs. at 3½d. per lb.		3	7 1

Generally the miners lived in villages where the whole community was concerned with the one occupation of getting and carrying coal. Apart from a grocer, a butcher, and one or two publicans, there were no shopkeepers and no members of the middle class. In an area of twenty square miles occupied by the Kingswood colliers there was no Established church and only one small Nonconformist chapel. Kingswood was only three or four miles from Bristol, Bedworth about the same from Coventry, yet the miners had no part in the lives of these cities. To the traders and shopkeepers the colliers appeared in the same light as the barbarian tribes to the townsfolk of a Roman garrison on the outskirts of the Empire, and when the colliers came to town they bolted their doors and barricaded their windows.¹ During the riots of 1756 the Warwickshire colliers levied a contribution on several villages under threat of destruction. For many years the Kingswood colliers imposed a danegeld on the parish of Bitton; and neither Bristol, Bath, Gloucester, nor Hereford was free from their predatory raids.

Observers of the colliery population were unanimous in condemnation of its coarse manners and brutal sports, among which bull-baiting and shying at cocks figured largely. The Scottish colliers, it was said, were "savage and brutal in their manners, destitute of all the principles of religion and morality, perfectly indifferent to the opinion of the world".² In 1720 a collier sold his wife for five shillings in the market-place of a Staffordshire town³—and if her reputation was at all like that given to the wives of northern colliers she was dear at the price! "The wives of Pitmen", says W. Thomas, "are in general a very indolent set of women—either strangers to cleanliness, frugality or economy. It is no unusual thing to see a Pitman, his wife and family, the first week after the receipt of their wages, indulging

¹ Eayrs, *Wesley and Kingswood*, 42.

² Bald, *op. cit.*

³ Hackwood, *Staffordshire Customs, Superstitions and Folk-lore*.

themselves in the use of animal food three times a day, and the next living on a little rye bread with oatmeal and water. Except in harvest, when they employ themselves in harvesting and reaping, the women seldom do more than attend to the necessary calls of the Family, and that in a lazy, idle manner." This indictment, however, was written a generation after women had ceased to be engaged underground in the Northern Coalfield. In Cumberland and Lancashire women still worked as "hurriers" in the pits; and whatever other charges he may lay at their door, the reader of Bald's account of the wives of the colliers of Fife and the Lothians will at least acquit them of indolence. In these areas where women worked underground, life in a mining village was a grim business.

It would be wrong, however, to paint the picture of collier life without some relief. The mining population of this period was no more devoid of vigorous personalities than in later times. George Stephenson, it should not be forgotten, was a collier; and before and after him, many of the devices from which modern railway transport has been built were worked out by men whose lives were lived about the pit hills and the underground ways of Northumberland and South Wales. Others there were whose spirits found release in pure rather than applied science: among them William Fluelling, the learned collier of Mangotsfield, who, dying in 1773 at the age of eighty-six, attained the altitude of a rhymed epitaph in the *Gentleman's Magazine*:¹

Beneath this humble turf there lies
An honest miner, learn'd and wise.
To latest life from early youth
His search was philosophic truth.

In nature's book, by nature taught,
He learn'd to think as Newton thought;
And with an astronomic eye
Measured the rolling orbs on high.

¹ 1773, p. 614.

A student of Halley and Kiel, he often spent whole nights in gazing at the stars, and from his wages, earned in the pit, he had laid out £30 in scientific works. He ground lenses, constructed telescopes and microscopes, and was the author of an almanack. The geologist, Dr. Hutton, it is said, was a hewer at Long Benton Colliery on the Tyne; and the elder John Buddle began as a working collier, became a village schoolmaster, and finished up as viewer of Wallsend Colliery, with some reputation as a mathematician.¹

Then there were the heroes of Methodism: Robert Haslem, the Yorkshire cock-fighter, whose conversion and death on the pit hill in 1779 were recounted in verse by the poet Cowper;² Victor Purdy of Kingswood, the author of nearly two thousand hymns, who established what was surely more than a local record by reading through the Bible forty times;³ and Joseph Rawlings of Wednesbury, who, filled with remorse at having ill-used Wesley when he visited the district in 1749, himself became a pit-head preacher. "This very singular pastor", says a newspaper⁴ of June 1791, "was blind; but he worked, nevertheless, on the week-days as a collier, and, what was more extraordinary, he distributed the greater part of his earnings amongst his auditors in cases of sickness".

The isolation of the colliery village from the life of a larger community was, indeed, never so complete as that of the agricultural hamlet, for it was broken occasionally by the migration of miners from one colliery to another. "The conditions of working and their wages, are for the most part so hard, as causes the works often to be deserted and forsaken", says a writer⁵ of 1707. "And it

¹ Galloway, *op. cit.* 267; *Dict. Nat. Biog.*, s.v. Buddle.

² "The Remarkable Story and Sudden Death of a Cock-Fighter, Who died on the Pit-hill as he was about to descend into a Coal-pit. Together with a Copy of Verses upon the Occasion by the Famous Poet, William Cowper, Esq.", Religious Tract Society.

³ G. Eayrs, *op. cit.* 209.

⁴ *Bell Coll.*

⁵ *Some Account of Mines and the Advantages of them to this Kingdom* (1707), 66, British Museum.

is usual with the workmen if they can hear of another place where they may find better wages, to leave both the work and their masters". Between one coalfield and another, moreover, there was a flow of specialised labour, a mere trickle, no doubt, but sufficient to act as an intellectual leaven, and perhaps, incidentally, to maintain congruence in the rates of wages. The occurrence of a name like Hartshorne—a name not unknown in South Wales to-day—in the account books of collieries as far apart as Coalbrookdale in Shropshire, Bilston in Staffordshire, and Worsley in Lancashire of itself suggests migration. But there is also evidence of a less inferential character.

In the technique of getting and selling coal Shropshire was in advance of other areas at the opening of the eighteenth century. It was here that the longwall method was devised and developed. And just as for the iron industry so for the coal industry, the region about Coalbrookdale became a centre of labour dispersion.¹ Entries in the Griff Coal-pit Books indicate that men were being transferred from Shropshire to Warwickshire at an early date:

Oct. ye 19 th , 1729. Tho. Marler Expences going for men			
into Shropshire. 8 Men 2s. 6d. each paid them to bear	£	s.	d.
their charges	1	0	0

When the Carron Works were set up near Falkirk in 1760, colliers from Shropshire were introduced into the pits at Kinneil to work by longwall;² evidence has already been presented of the activities of Shropshire miners at Haigh;³ and that the method was carried to the Bridgewater Collieries in Lancashire about the same time is shown by an entry in William Brough's Day Book:

1767 May 21. Paid Jas. Gough by Mr. Gilbert more than			
his Wages when he came out of Shropshire to try to get	£	s.	d.
the 4 foot coal longwork	0	18	0

¹ Galloway, *Annals of Coal Mining*, 20.

² *Trans. Inst. Min. Engrs.* vi. 384.

³ *Supra*, 31.

But it was naturally to the neighbouring coalfields of Staffordshire that most of the emigrants from Shropshire passed; and a mining commissioner of the nineteenth century, puzzled by terms in use among the miners of Staffordshire, had to seek for explanation in the older mining district of Shropshire.¹

Almost from the beginning the South Wales coalfield was worked by immigrant labour. As early as 1697 Sir Humphry Mackworth, after failing in an attempt to work the Gnoll Colliery with local men, travelled into other counties to find skilled miners;² and towards the end of the eighteenth century a veritable exodus by road and canal took place from Shropshire and Staffordshire to the coalfield of Glamorgan. From the Newcastle area colliery owners like the Brandlings came to sink pits in Yorkshire, and skilled viewers like John Curr of Sheffield were brought from the same region. The movement of specialised workmen from this field to pits in other parts of the country may be instanced by the following entry in a book of the Bridgewater Colliery:

1778, *Sept.* 8. By Bar. Tulley and Robt. Hutchinson's exp^e.

from Newcastle-upon-Tyne to Worsley and to and

from Worsley and Ellesmere when they went to Cut	£	s.	d.
rods to make Coal Baskets	2	7	3

And the number of absconding colliers who found asylum in the pits of Cumberland was so great as to call forth a complaint from the owners of the Tyne and Wear in 1795.³

It is doubtful, however, whether immigrants, other than specialised workers like corvers, often became permanent settlers. There was a strong feeling of hostility to the stranger, and the importation of outside labour was violently resisted by the colliers. About the year 1800, when Lord Dudley attempted to introduce into

¹ *Mid. Mining Comm., First Report*, xxxiv-xxxv.

² Wilkins, *The South Wales Coal Trade*, 28.

³ Two miners named Gorton, from Yorkshire, had much to do with the development of coal-mining at Seaton, in Cumberland. *V.C.H. Cumberland*, i. 373.

Staffordshire some thirty colliers from the Tyne, a riot broke out and his collieries were threatened with destruction.¹ And when in 1832, attracted by the opportunity of earning in two days as much as they could earn in a week in the lead-mines, sixty "groovers" moved from West Durham to Walbridge, the colliers stopped the engine and threw corves and tubs down the shaft when the groovers were below.²

Physical resistance apart, there were good reasons why the flow of labour from one area to another was rarely of appreciable volume. Geological conditions varied widely, and technique more widely still. Even to-day it is said to be easier to train local agricultural labour for the pits of South Yorkshire than to adjust the skill of colliers from other areas. In the eighteenth century the pitman accustomed to pillar-and-stall methods in Durham would have been lost in the longwall workings of Shropshire. Scottish colliers were afraid of the deep, inflammable pits of the Tyne and Wear. And when English miners were set to work in Scotland, "from the hardness of the coal and other causes, they soon took an opportunity of deserting, so that in a short time a straggler or two only remained behind".³

But if there were fences between the colliers of one area and those of another, there were mountainous barriers between colliers as a whole and labour in other occupations. The coal-miners of the eighteenth century formed, indeed, an hereditary caste almost as exclusive as that of the owners of mineral rights. "The customs and habits are so different from the other classes of the labouring poor that a Pitman is ill qualified to pursue any other kind of labour", wrote W. Thomas. "When they do change it is generally from the pit to the deck of a Newcastle collier". On the other hand, there was little influx of outside labour to the coal industry. Although

¹ Edington, *Essay on the Coal Trade* (1803), 25.

² *Report of the Trial of the Pitmen for the Riot at Walbridge Colliery.* Newcastle local pamphlets.

³ Bald, 81-2.

farm labourers in Northumberland and Durham occasionally sent their sons to the pits, it is improbable that the volume of labour so introduced was ever more than a minute fraction of the whole. For the industry was in ill odour. It was not only in Scotland that criminals were sentenced to penal servitude in the pits: in 1699 seventeen convicts had their sentences remitted on condition that they bound themselves to work in the mines of Sir Humphry Mackworth for five years; and about the same time a Secretary of State made the same embarrassed employer the offer of a number of convicted pirates for his coal-pits.¹ Free labour was hardly likely to be attracted by the prospects of such work-mates.

But there were more serious obstacles than this. In Scotland and the north of England, in particular, the work of the collier was of so specialised a nature that a long apprenticeship was necessary. "He who is to be a Scotch collier must begin his labour as soon as he is able to creep to the coal-pit", wrote Bald, for only those inured to them from childhood could endure the conditions of work in the Scottish pits. And in Northumberland and Durham it was necessary to ascend by the successive stages of trapper, foal, headsmen, and half-marrow before one became an authentic pitman. Generally the training was given by the father, who carried his children to work with him from an early age. Advertisements like that of an Alnwick colliery² in 1810, "Pitmen wanted that can bring Boys with them to put", are by no means uncommon in the newspapers of the Newcastle district. And that the apprenticing of boys to their own fathers existed in other coalfields and was encouraged by the employers is instanced by an item in the Cash Book of Dame Dorothy Bradshaigh of Wigan:

1 October 1773: By paid Chas. Lowe for training and in-	£	s.	d.
structing his son for a Drawer	1	11	6
Henry Winrow for his son's latter year	10	6	

¹ C. W. Wilkins, *The South Wales Coal Trade*, 29.

² *Bell Coll.* vol. vi. 80.

The colliers were notoriously a prolific race, and a few families would sometimes man a whole colliery. At Haigh in 1765 the five pits at work were described as Matthew Lowe's Pitt, Henry Lowe's Pitt, Peter Lowe's Pitt, Thomas Lowe's Pitt, and William Lowe's Pitt.¹ And that generation followed generation in work underground is demonstrated by a glance at the records of any colliery concern with a long history. Colonel Blackett informs the writers that his colliery to-day has employees descended from the men who set their marks to an indenture of 1767.

In Wales and the English Midlands the coal-miners conformed less closely than those of Scotland and the north of England to the ideal "non-competing group" of economic theory. For in the pits of these coalfields labour was less specialised than in the larger and deeper pits of the north. It is known that in 1777 the Kingswood collieries were providing work for unemployed felt-makers from Bristol;² and Bald refers to the Irish labourers who entered the coal-works of the west of England.³ At the end of the Napoleonic wars men displaced from the army, and the unemployed from varied trades, found work in an industry which, in spite of general trade depression, was undergoing phenomenal expansion; and there is evidence of more extensive migration from 1815 onward. A document relating to Poor Law Settlement examiners at Staveley in Derbyshire, made between the years 1822 and 1828, sets forth the industrial careers of forty-seven individuals.⁴ Of these, fifteen had worked as colliers at one time or another, but only three stated definitely that they had worked in the pits all their lives. The devastating effects of military service on an industrial career is exemplified by the history of John Nouch. Born in 1793, he had been apprenticed at the age of 9 to a framework knitter

¹ *Account Book*, 1765, Haigh MSS.

² Redford, *Labour Migration in England*, 51.

³ Bald, *op. cit.* 80.

⁴ Sheffield Municipal Reference Library, *Jackson Coll.*

of Burdon Joyce for seven years, but enlisting a few weeks before his indenture would have expired, he had served for seven years in the army, after which he found employment, not in his old trade, but as a colliery labourer at Staveley. Similarly, Richard Clay, who was born in 1790 or 1791, had been first hired to a farmer at Barlow, and then at the age of 14 had become apprentice to his father, a viewer in the colliery at Bolsover. After serving under the indenture for five and a half years he had enlisted in the Royal Artillery, and when he returned after two years' service abroad, he was obliged to take work as an ordinary collier at Staveley, and was ultimately forced to apply for poor relief.

But, for our present purpose, the point of interest is that several of these collier paupers had spent part of their working lives in occupations other than coal-mining: three had served as hired labourers in agriculture, one had been a baker's apprentice, and another described himself as the son of a cordwainer.

Even in Northumberland and Durham an inflow of labour took place during the trade depressions of the 'thirties and 'forties of the nineteenth century. As the industry moved away from the Tyne Valley, northward to the River Blyth and southward to the Wear and the Tees, lead-miners, agricultural labourers, and navvies took to the coal-pits. And between 1815 and the middle of the century there occurred a large Irish migration to the coalfields of Scotland and the west of England, with, it seems likely, some lowering of economic standards.¹ Real wages, it is true, were almost certainly higher in the 'forties than in any but the most prosperous of the war years.² But in some other important respects the conditions of mining labour before the beginning of last century strike one as less unpleasant than those revealed in the Reports of the Commissioners of the eighteen-

¹ Welbourne, *The Miners' Unions*, 46; Bremner, *The Industries of Scotland*, 20.

² *Report of Mining Commissioners* (1844), vol. ii. 37.

forties. If this impression is well founded, and not a mere illusion of distance, if some deterioration had really taken place, it is not difficult to guess at the causes. Partly it would be due to a passing depression of trade, partly to the greater depth and size of the later coal-mines and the undue pace at which the industry had been expanding. But it is not unlikely that a contributory cause was the influx to the coal-mines of a population that had neither the professional traditions nor the technical skill of the colliers of the eighteenth century.

CHAPTER X

THE EFFECTS OF INDUSTRIAL PROGRESS ON LABOUR

His children are far from safety,
And they are crushed in the gate.

JOB v. 4.

ANY attempt to evaluate the gains and losses of the underground workers between the early decades of the eighteenth and those of the nineteenth centuries is faced with difficulties. Early writers are usually pre-occupied with technical or commercial matters and have little to tell us of the lives of the workers; and later writers are generally partisans with a case to prove. There are few concerns with records extending over the whole period, and, in any case, information as to the conditions of labour and the hours of work is rarely found in books of account. To compare the stray data that these afford for the first half of our period with the *ex parte* statements of pamphleteers of 1830, or even with the more objective presentments of the commissioners of the eighteen-forties, is obviously unsafe. Nevertheless, the task must be attempted, even though it may be found impossible to give an unqualified answer to the question whether a hundred years of technical progress had eased, or had added to, the burden of the colliery worker.

In the matter of personal freedom the balance is uncertain. A great step forward had been taken in Scotland by the abolition of collier serfdom, and in Northumberland and Durham the yearly bondage was beginning to give way to systems of hiring that gave greater liberty of movement and were less hampering to trade-union activities. But in the coalfields of the Midlands the

butty system with all its petty tyrannies was more firmly established, and the associated evil of the tommy-shop had almost certainly become more widespread.

That both money wages and real wages had risen is beyond doubt.¹ In Northumberland and Durham by 1842 wheaten bread had taken the place of the rye bread that had been the staple food of the northern collier before 1800. And in other coalfields the reduction in the price of such necessities as soap, salt, and wearing apparel was reflected in a higher standard of health.²

The Scottish collier of the early nineteenth century was badly housed in a stone cottage with one or two rooms.³ But he was probably better off in this respect than his predecessor, for, among the causes of the scarcity of the miners in Scotland, a writer⁴ of 1793 included "the colliers being put into miserable mean hovels". In the north of England the accommodation was better and the homes had often a piece of ground attached. "A pitman is seldom without his pig and a hen or two" (wrote W. Thomas⁵ in 1800). "Gardens are becoming much more frequent than they were. In almost every colliery on the Tyne pitmen are provided with houses by their employers, for which, and about 8 or 10 cart-loads of coals annually, they pay 3d. a week". At Middleton Colliery, near Leeds, in 1822, house, garden, and household coal were given in return for a fixed annual payment of 20 shillings⁶—a rent that was clearly less than an economic one. Twenty-one "single houses" erected by the proprietors of the Chapter Main Colliery (Durham) between 1804 and 1809 cost £44:3:3 each, and three double workmen's houses cost £64:19:3

¹ *Supra*, 158: "Some decrease has taken place in the average amount of wages during the last twenty years; but the reduction is not so great as that which has taken place in the cost of all the first necessities of life". (*Penny Magazine*, March 31, 1834, p. 124.)

² *Rept. of Child. Empl. Comm.* App. i. 586, ev. Nicholas Wood, and 84 ev. Matthew Webb.

³ Clapham, *op. cit.* 36.

⁴ *Account of the Mines at Culross*, 68.

⁵ *Letter to Sir John Swinburne.*

⁶ Batty, *op. cit.* 188.

each to build.¹ Though data are lacking for a comparison of the earlier with the later houses of the colliers, Cobbett declared that those of the Durham miners in his day were good. The nineteenth century seems to have brought sanitation and standardisation; the new three-roomed cottages, plastered with lime, with blue slate roofs, were probably more weather-tight and less noisome than those they superseded, even if they were "as like to one another as so many soldiers are like to each other".²

With deeper and larger pits the temperature of the working places was higher, and the introduction of pillar-working brought with it an increase of casualties from falls of the roof. For a time after the opening up of the eastern part of the Tyne Coalfield the death-roll from explosions increased; but improvements in ventilation had their effect, and as early as 1800 it was reported that there was little foul air in the pits and that accidents were less frequent than formerly.³ Those that did occur were, it is true, more devastating; and it seems likely, as already pointed out, that the first result of the introduction of the Davy lamp was to encourage the working of dangerous places, and therefore to increase rather than to diminish casualties.

Whether the labour itself was less onerous is doubtful. Some of the evidence of elderly colliers before the Children's Employment Commission suggests that men worked less strenuously in 1842 than when the witnesses were young. But age is notoriously prone to reflections on the degeneracy of youth, and we must beware of judgments warped by years of toil. It is impossible to measure the effort put forth by men in one generation against the effort of those in another; and variations in seams and changes in methods of work render valueless the statistics of output per man collected from time to time by colliery viewers.

¹ Statement of Working Expenses in *Watson Coll.*

² Clapham, *op. cit.* 36; *Rept. of Child. Empl. Comm.* App. i. 135.

³ *Letter to Sir John Swinburne.*

When we turn to hours of labour we are on safer ground. A sheet in an account book at Arbury¹ dated May 27, 1702, indicates the length of the day worked by the companies of miners at Griff Colliery. The custom had evidently been to work a single "break", but now the management wished to introduce a two-shift system. It was proposed that at three pits the men should "prepare Coals in the day for the rest of the Comp^s to Turn a Nights; that no Coals aft^r 7 in y^e Morn. or before 5 at Night be drawn at these 3 pits. Sale to be a days". At the other pits the companies were to "prepare Coals a nights to turn a days from 5 a Night to 7 in the Morn. The sale to be a Nights". The word *turn* clearly means draw from the pit, and *sale*, as already pointed out, probably signifies the act of stacking the coal in heaps at the surface ready for the purchaser. Since the terms were accepted by the men, it appears that at this colliery alternative shifts of 10 and 14 hours were worked. The average of 12 hours a day is precisely the same as that worked in the same coal-field—and almost certainly in the same colliery—a hundred and forty years later.²

In Scotland, Cumberland, and the Great Northern Coalfield the hours of the adult coal-getter cannot be precisely determined. The hewer was paid on a basis of a certain output (known in Northumberland and Durham as the *stint*, and in Cumberland as the *darg*) which was considered a fair return for a normal day's work. When he had cut this customary quantity, whatever the time occupied, the hewer was free to leave the pit, and the working day naturally varied with the nature of the seam and the ability of the individual. Generally the pitman was content when he had reached his standard output, but here and there the more ambitious man might remain below ground longer so as to increase his output. It was the business of the barrowmen or putters

¹ *Proposals to the Severall Companyes at Griff Co: Pit Field.*

² *Rept. of Child. Empl. Comm. App. i. 91.*

to remove to the bottom of the shaft whatever coal had been cut during the day: they were always obliged to remain below after the hewers had left the pit, and their hours of labour were considerably longer than those of the adult pitmen.

According to M. Jars, whose tour of the British coalfields and ironworks was made in 1765, the hewers at Walker Colliery on the Tyne worked only 6 or 7 hours a day; but the boys who filled the baskets and drove the horses were in the pit for 14 hours—from 2 in the morning till 4 in the afternoon.¹ At the end of the century the working day of both boys and men appears to have been longer: "During the period in which they are employed as Trap-door Keepers, Lads, Half Marrows, Headsmen, and Put-and-Hewers their hours of labour are from 12 to 18 out of the 24 (wrote W. Thomas² in 1800), when employed as Hewers not more than from 8 to 10". At Whitehaven in 1765 adult colliers worked 8 or 10 hours,³ and in 1801 their normal day was said to be 9 hours, though "on some urgent occasions the period of labour has been limited to 8 hours; in which case, there have been three successive changes of men and horses in the same pit within twenty-four hours".⁴ Eight to ten hours was again the regular period of work of the women bearers in Scottish coal-mines about the same time.⁵

At Barlow in Derbyshire a man engaged in sinking worked five 12-hour shifts in a particular week in 1776, but, as his remuneration per shift was 33 per cent higher than that he normally received, we may infer that the usual working day was one of 8 hours, though there are also occasional references to 6-hour shifts—again in the specially arduous task of sinking.⁶ At Middleton Colliery, near Leeds, in 1787, the working

¹ *Voyages Métallurgiques*, cited Galloway, 283.

² *Letter to Sir John Swinburne*.

³ Jars, *op. cit.*, cited Galloway, 352.

⁴ *Account of Coal Mines near Whitehaven* (1801), 101.

⁵ Bald, *op. cit.*

⁶ Barlow MSS.

day of the coal-getters was, according to the statement of the proprietors, of 8 hours' duration.¹

No general reduction of hours seems to have taken place in the early decades of the nineteenth century. A temporary improvement may have been effected during the period of intense demand for colliery labour after 1804, but in 1809, when the associated employers of Northumberland and Durham made their attempt to reduce the binding-money and alter the date of the annual hiring, they resolved that drivers on the Tyne should work 14 hours to the shift.² In the 'twenties hewers evidently normally worked for rather longer than in the seventeen-sixties, for there is evidence that it required 8 to 10 hours to get the "darg" at Felkington Colliery in 1823;³ and one of the rules of the United Association of Colliers of 1825 was that no collier on piece-wages should work for more than 8 hours, and no collier on day-wages for more than 12.⁴

In 1831 the pitmen of the North were demanding for their assistants a 12-hour day in place of the 15 or 18 hours which they declared to be common.⁵ In this they were successful, and the terms of the Killingworth bond of 1836 indicate that the standard day here was one of 12 hours.⁶ The commissioners of 1842 and 1843 report that 12 hours was the common period of work in Staffordshire, Shropshire, Warwickshire, Leicestershire, Durham, and Cumberland; in Yorkshire 10 or 11 hours constituted the regular working day of children, though some boys worked for 12 hours; and children in Scotland were normally underground for between 11 and 13 hours.⁷ In a few instances it is reported that such periods are shorter than those formerly worked, but in view of

¹ *Leeds Mercury*, January 2, 1787.

² Bulman and Redmayne, *op. cit.* 41.

³ *Bell Coll.* xv. 437.

⁴ Rules in *Bell Coll.*

⁵ Broadsheet, *Bell Coll.* xi.

⁶ Bond in *Bell Coll.* See also *Child. Empl. Comm.* App. i. 627, ev. Mr. Hunter.

⁷ *Rept. of Mid. Min. Comm.* (1843), xxix.; *Rept. of Child. Empl. Comm.* (1842), 9, 34, 91, 98, 126, 167, 252, 300, 319.

the numerous instances of boys remaining underground for as long as 24, 36, and even 48 hours at a stretch one would hesitate to assert a general improvement.¹ For one class of labour, at least, the day had lengthened. A woman of 70, who had worked for many years in the Carron mines, told the sub-commissioner² that an extension of hours had come about when the primitive practice of bearing was abolished and putting took its place: "though coal-carrying was harder than putting, we never worked longer than the consumpt of one candle, which was much shorter labour" than in 1842.

There is a common impression that the earlier race of wage-earners was more regular in its habits than its successors, and that holidays and "absenteeism" are products of modern conditions. An examination of the books of collieries in the eighteenth century gives no support to the belief. An Act of a Scottish Parliament in 1641 asserts that the coal hewers "doe ly from ther worke at Pasch Yule Whitsonday and certane other tymes in the year, which tymes they impley in drinking and deboishrie to the great offence of god and prejudice of ther maister". It was ordained that they should work six days of every week, or pay a fine of 20 shillings for every day's absence from labour; and to prevent the celebration of Yule "in a boisterous manner", after 1647 "fitting and entering" was to take place on December 1, and there was to be no superstitious observance of Christmas Day.³ It seems unlikely that these grim remedies had effect. "The workmen of this blacke labour observe all abolyshed holidays, and cannot be wayned from their follye", said a later observer;⁴ and the miners at Saltcoats in the early part of the eighteenth century certainly worked only five days a week.⁵

In England the colliers showed the same regard for

¹ *Rept. of Child. Empl. Comm.* (1842), 521.

² *Ibid.* p. 481, ev. of Elizabeth Paterson.

³ R. W. Cochran-Patrick, *Early Records of Mining in Scotland*, 1.-li.

⁴ *Cambridge Register*, 1799, cited C. W. Williams, *The South Wales Coal Trade*, 20.

⁵ N. M. Scott in *Scot. Hist. Rev.* vol. xix.

established high-days. At Shibden Hall, Yorkshire, in 1714, an allowance of 3d. against the entry "Monday pots" relates to a feast, and there were also "wake pots" for fairs, and a gift of 6d. to men and 3d. to boys at the New Year.¹ At Sir Roger Bradshaigh's pit, near Wigan, no work was done on Shrove Tuesday, Good Friday, or Ascension Day; and at Christmas the pits were closed for a full week, and in some years for a fortnight.² Political events were also sometimes the occasion of a cessation of work. Instead of the usual figures of output, the Cannel Pit Book records on December 13, 1776, "A Day of thanks giving agst a Merica". Again February 10, 1779, was kept as "A General fast Day concerning a Merica's Warr", and less than a year later, on February 4, 1780, there was yet another general fast. At the Duke of Bridgewater's colliery a Christmas feast was provided, and it was the practice at many other places to give the men a sum of money for ale at Christmas time.

Perhaps the biggest celebration, however, was that which occurred when a new pit was opened, or when the coal was first reached. When the waggons began to load from the newly won colliery on Waldrige Fell, near Chester-le-Street, on September 20, 1779, "Some thousands of People attended preceded by a band of Music, Colours flying etc. In the afternoon they returned to the houses near the Colliery, where an excellent cold dinner was provided, consisting of a sheep roasted whole, six sheep in quarters, and half an ox, which was washed down with 8 barrels of good ale. The bells at Chester were rung at intervals during the day".³

¹ Wheater, *Old Yorkshire*, 280.

² *Haigh MSS. Peter Grimshaw's Book, 1770-85, passim.*

³ *Bell Coll.* A pitman's wedding must have put a stop to work at many pits on October 14, 1754: "William Wetherburn, pitman, belonging to Heaton, was married at All Saints Church in Newcastle, to Elizabeth Oswald, of Gallowgate. At the celebration of this marriage there was the greatest concourse of people ever known on a like occasion. There were five or six thousand at church or in the churchyard. The bride and bridegroom having invited their friends in the country, a great number attended them to church; and

In addition to the recognised feasts it is clear that there were many unofficial holidays. "Collier Monday" is no recent innovation, and it was the custom to take half a day from work at the periodic pays. The frequency of these varied from area to area and even between collieries in the same district. A weekly pay, for example, is found in circumstances so remote from one another as Griff (Warwickshire) in the opening decades of the eighteenth century, Culross (Scotland) and Wakefield (Yorkshire) in the seventeen-nineties, and Aberavon (Glamorgan) in the opening years of the nineteenth century. Wages were paid fortnightly at the Duke of Bridgewater's collieries in the seventeen-sixties, and at Tanfield Bridge, Pontop Pike, and virtually all the other collieries of Northumberland and Durham. At Charlaw Colliery in this area, however, they were paid every third week in 1766, as they were also at Barlow in Derbyshire at the same time. At other Derbyshire collieries, such as Staveley and Butterly, a monthly reckoning between employer and employed was the rule. Difficulty in obtaining ready money in large sums was probably the reason for the longer of these intervals between pay-days, but it is possible that the readiness of the colliers to take a holiday whenever they received their wages induced the employers to favour the less frequent pays.

At Haigh the system of book-keeping was such that we can determine the number of days on which each of the hewers was at work, and these have been counted for years taken at random. In the accounting year October 1769–October 1770, there were only 48 weeks, or 288 days, when Peter Grimshaw's Heys pit was open. One collier actually worked 240 of these days, or an average of 5.1 days a week; two others each achieved 232 days' work, or 4.8 days a week; and another 192 days, or 4.3

being mostly mounted double, or a man and woman upon a horse, made a very grotesque appearance in their parade through the streets. The women and the horses were literally covered with ribbons" (*Trans. N. of Eng. Inst. Min. Engrs.* xv. 207).

days a week. These men had, however, a full month's rest when the pits were closed: in years when there were more opportunities of work the average was somewhat lower. Thus in 1772-73, when the only time the pits were not open was for a week at Christmas, a collier, John Morris, averaged only 4.3 days a week; in 1781-82, when the pits were open for 49 weeks, his average was 4.6, and in 1785-86 the same man worked 4.5 days a week—once more over a period of 51 weeks. In 1773-74, when work was possible during 49 weeks, the accounts show the following results for the eight getters at the Whalley Cannel Pit of the same colliery:

Days per week.		Days per week.	
Henry Heys . .	4.1	John Seddon . .	4.4
John Jackson . .	4.3	James Green . .	4.4
William Morris . .	4.7	Thomas Westhed . .	4.3
Thomas Dickson. .	3.1	John Green . .	4.3

In the North-Eastern Coalfield employment was perhaps more regular than at the land-sale collieries of other areas, for London provided a steady market, and in the larger pits of the Tyne and Wear absenteeism was more expensive to the employer. Stoppages occurred, however, from time to time owing to bad weather in the North Sea, and even when trade was active the pitmen were not unduly pressed. Under the Gatherick bond of 1706, 5 days' work a week is all that is required by the master; at Byermoor, in 1770, 9 days were worked each fortnight; and in the 'eighties at Pontop Pike the pits worked only 10 days a fortnight, and the average number of shifts per man was probably somewhat less.¹

If these conditions were typical, it can hardly be held that the colliers of this period took life at a faster pace than their successors. In the nineteenth century employers often complained of absenteeism, but they had their remedies. In Warwickshire it was checked by a fine of 5s. a day, and at Tranent in the east of Scotland

¹ Bulman and Redmayne, *op. cit.* 43, 44.

by the obligation to work two days for every day's absence.¹ The collier of the eighteen-forties, like his predecessor, usually devoted to refreshment the day following the fortnightly pay, and there was a distressing tendency to leave the pits early on Saturday afternoon. But the 11 or 12 days a fortnight worked in Shropshire in times of normal trade, the 10 days a fortnight fixed by regulation at the collieries of the West of Scotland, even the 9 days which was the average for the Lothians, argue a somewhat greater regularity of work than at Haigh seventy years earlier. And though in Durham it was said that sometimes only 7 or 8 days would be worked in a fortnight in 1842, the reason was that the employer was unable to provide full employment: the penalties laid down in the bonds of the nineteenth century, no less than in those of the eighteenth, were sufficiently heavy to prevent widespread absenteeism.²

In attempting to strike a balance-sheet in terms of welfare weight must be given to the conditions of employment of women and children. It is not easy to determine the extent to which women's labour was employed in the pits of the Great Northern Coalfield in the early part of the eighteenth century. Much has been made of the instance of Abigail Jackson, who was killed in a pit explosion at Gateshead in October 1705. But it should be observed that she was the only female of the thirty-one people who lost their lives, and, since she was the daughter of the owner of the pit, her presence underground cannot be taken as proving the regular employment of women there. Three years later, however, a woman was among the casualties in an explosion at Chester-le-Street; and at the very end of the century an old woman was working as a putter at Denton Burn Pit.³

¹ *Rept. of Child. Empl. Comm.* App. i. 93, 390.

² *Ibid.* App. i. 37, 391, 320, 127.

³ Galloway, *op. cit.* 232-4, 305; *Rept. of Child. Empl. Comm.* App. i. 613, ev. Ralph Laycourt.

The last of these instances was clearly exceptional: it is generally accepted that the employment of women and girls below ground ceased in this coalfield about 1780, though girls of 11 to 16 years of age were engaged in picking stone from the coal at the pit head in 1800, as they are in Wigan to this day.¹ It is unlikely that the number of women in the pits of the Tyne and Wear was at any time great, for no mention has been found of women workers in any hiring-bond or in any of the multitudinous accounts in the Watson Collection.

In Cumberland, on the other hand, the proportion of female to male labour was high throughout the period. In 1800, at Howgill Colliery, near Whitehaven, a pit with 10 hagggers or hewers employed 2 women as fillers and 4 in tending the roads; another with 7 hagggers had 2 women fillers and 1 way-woman; a third had 7 male hagggers, 1 woman filler, and 5 women in the roads; and a fourth with 15 hagggers had 3 women fillers, 1 woman hooker or hanger-on, and 4 women in the roadways.²

About the same time in the east of Scotland the more enlightened coal-owners, following the example of the Earl of Dundonald in 1793, were ceasing to employ women as coal-carriers.³ After the emancipation of the Scottish serfs "the difficulty of procuring a collier with a family of bearers (wife and daughters) is now so great that it is no easy task to extend, or even keep up the numbers in those collieries where bearers alone are employed"; and since colliers without families would not work where women bearers were employed there was every incentive to substitute other methods.⁴ Nevertheless, the practice of carrying coal on women's backs was still common in Scotland in 1842, and even where it had been discontinued women were employed in drawing or hurrying. In some areas of West Scotland, indeed, the use of them as drawers—not as bearers—was stated by

¹ *Letter to Sir John Swinburne.*

² *Accounts of Howgill Colliery, Watson Coll.* 3093.

³ *Description of the Estates at Culross*, 66, *Bell Coll.*

⁴ *Bald, op. cit.* 92, 94.

a commissioner of 1842 to be of recent introduction; and a working collier declared that "there are more lasses now drawing in this pit than he remembers before in this part of the country".¹

In the coalfields south of the Mersey and the Trent women, it seems, never worked below ground in the period covered by this volume; and the only references to women's work in the account books of coal-masters here clearly refer to tasks performed on the surface. In Lancashire and Yorkshire, on the other hand, the underground labour of women in the nineteenth century is well attested.² It is therefore surprising that a study of the documents of the Bradshaighs of Wigan, the Duke of Bridgewater of Worsley, the Charlesworths of Wakefield, and the Duke of Norfolk of Sheffield should have afforded not a single instance of women's labour in the pits during the previous century. The absence of feminine names in the records does not prove that the colliers never took their daughters underground, but if the practice had been common it would probably have revealed itself. Women and girls certainly worked in the pits at Bowling during the eighteenth century.³ And though by 1815 their employment had been discontinued here, there were many married women as well as girls in the mines of Yorkshire and Lancashire in 1842. It is by no means certain that in the country as a whole the amount of female labour had decreased.

On the other hand, the employment of boys in the mines had almost certainly increased, not only absolutely but relatively to that of adults, and there was a growing tendency to put very young children to work. At the

¹ *Rept. of Child. Empl. Comm.* App. i. 324, 363.

² In 1827, for example, a woman, Alice Howcroft, was killed by a large piece of stone which fell upon her from the mouth of a shaft at Little Lever, in Lancashire. The note sent by the Constable to the Coroner read as follows: "Little Leaver June 28, 1827—to Mr. Milns pleas to attend a inquest at Samuel Hamers sin of the air and houns as son as you can to morrow as the wis to Burey to morrow and have to take the Corps 4 mills she was cild by a fall of sumthing down the pit" (*The New Times*, July 10, 1827. *Bell Coll.* xxi.).

³ Cudworth, *History of Bolton and Bowling*, 238-40.

beginning of the eighteenth century the coal had been transported underground by adult barrowmen, for the laden sledges were too heavy to be drawn by children. It has been pointed out that the introduction of horses into the mines gave rise to a demand for boys to act as drivers, but youths were still employed to drag the corves from the coal face to the horse-ways; and at Whitehaven as late as 1801 some of the coal was conveyed all the way to the pit bottom by men unaided by horses.¹ The introduction of the wheeled corf and the tramway lightened the task of the putters, and so brought it within the powers of young children. On the Tyne it was common for the youth in charge of the tram to be assisted by a smaller boy, and the lot of this child was often a sore one. "By his superior Partner in the work when employed at the Tram he is frequently urged by severe blows and the most abusive language to a greater share in the labour than he is able to perform" (wrote W. Thomas in 1800), "hence the young mind is easily taught the necessity of deceit and evasion which it scruples not to practise at the expense of truth and honesty".²

It is important to observe that it was in the coal-fields where technical progress was most marked that this extension of child labour was greatest. In backward coalfields, like those of Tipperary and Kilkenny, where the tramway was unknown in 1842, strong young men were employed in hurrying the coal, and there was very little child labour underground. In Northumberland and Durham, where the tramways were in general use, the putters, who pushed the corves along them, were said in 1842 to be younger than their predecessors of the days before the invention of the wheeled corf.³

Improvements in ventilation had also extended the demand for child labour. Infants of 5 and 6 years of age

¹ *Account of the Coal Mines near Whitehaven* (1801), 99.

² *Letter to Sir John Swinburne.*

³ *Supra*, 68-9.

were manifestly too weak to act as beasts of burden, but, after the adoption of the practice of "coursing the air", they could be employed as trappers in work that was too monotonous for adults to endure. Again, as pits grew bigger there were increased opportunities for the use of children in shovelling slack and dirt, in tidying up the underground roads, and in running errands for the adult colliers.

We have no wish to take a pessimistic view of the results of technical progress during the period from 1740 to 1840. We accept the view that the position of the worker in manufacturing industry had improved, that, with exceptions, the standard of life of the town worker had been raised by machine production. We think it even possible that the life of the children in the factories was less burdensome than that in the domestic workshops of an earlier generation. It was perhaps just because there was so little scope for machinery in coal-mining—precisely because coal-mining did not pass through an Industrial Revolution—that we are unable to pass an equally favourable judgment on its history. One inclined to look on the sunnier side of doubt might indeed urge that, as the eighteenth century gave place to the nineteenth, the adult collier found his work less arduous, his earnings higher, and his domestic circumstances more civilised. But only a very determined meliorist, blinded by a preconceived theory, could assert with confidence that it was better to be a collier's child in the opening years of Victoria than in those of George II.

CHAPTER XI

ROYALTIES AND WAYLEAVES

Thou shalt be in league with the stones of the field.

JOB v. 23.

I

IN its simplest form the mineral lease consisted of a document providing for product-sharing between the proprietor and the working capitalist. In some places, apparently, it was customary to divide the coal into three parts, one of which went to the landlord, one to the lessee, and one to the working colliers: it was possibly under this traditional arrangement that when, in 1647, Henry Mather obtained of John Downes of Wardley Hall his lease of pits at Farnworth (Lancashire), it was agreed that he should pay to Downes one-third of the coal obtained.¹ Elsewhere the proportion given to the lessor was smaller. A grant made to the tenants of the monastery of Dunfermline in 1555 stipulated for the payment of every ninth load;² at a Scottish colliery in 1699 the proprietor obtained one-fourth of the product;³ and as late as 1757 the ironmaster, John Wilkinson, handed over to the owner of the minerals a sixth part of all the "coal, kennel, and slack" raised at Cal Glas, near Wrexham.⁴

Long before the eighteenth century, however, money had taken the place of coal in the payment of rents. Frequently an annual sum, termed variously a fixed rent, a certain rent, a dead rent, or a sleeping rent, was all that was paid. At Low Moor (Yorkshire), for example,

¹ Hart-Davis, *History of Wardley Hall*, 232.

² R. W. Cochran-Patrick, *op. cit.* xlv.

³ M. N. Scott, Documents relating to Coal-mines in the Saltcoats Dist., *Scot. Hist. Rev.* xix. 90.

⁴ Palmer, *John Wilkinson*, 31.

as late as 1753, a colliery was let at an annual rent of £100 for a period of five years, and the sole condition imposed was that the lessee should fill up the pits and remove the rubbish heaps when he ceased to work the colliery. Even in 1802 this colliery was again leased at a simple rent of £300 a year for twenty-one years, and the only additional stipulation was that reparation should be made for any surface damage, and that the land should be restored to arable at the end of the term.¹

Sometimes payment of a fixed rent was combined with payment in other forms, as when, in 1738, the burgesses of Swansea granted a mine to Gabriel Powell at a yearly rent of 10s. and a pair of pullets for the portreeve, or 1s. in lieu thereof.² And frequently the proprietor took some part of the payment in coal. In 1707, for example, the Duke of Norfolk required his lessees to supply "forty waine Load of Coales for ye use of Sheff^d Milnes, without any Price".³ In letting Long Benton Colliery in 1742 Lord Carlisle stipulated that eight waggon-loads of coal should be supplied to his tenants.⁴ In 1762 the Corporation of Newcastle-upon-Tyne imposed on their lessees the obligation of providing 200 fother of coals for the use of their hospitals and guard-houses at the special rate of 2s. 6d. a fother.⁵ And as late as 1807 the lessor of East Denton Colliery provided that two tons of coal should be supplied for his own use each year.⁶

Since, however, a mineral lease represents a sale of part of the property, most landowners preferred some arrangement by which the rent varied with the amount of coal raised to the surface, or, as in Durham, with the amount removed from the pit head.⁷ Thus, in 1702, the Duke of Norfolk granted the coal under the waste lands

¹ *Low Moor MSS.*

² Phillips, *History of the Vale of Neath*, 237.

³ *Norfolk MSS.*

⁴ *Journal of John Watson.*

⁵ *Watson Coll.* 3086.

⁶ *Ibid.* 3038.

⁷ Payment according to the amount of coal led away resulted in large accumulations of screened coal at the pit head. *Vide* J. H. Holmes, *Coal Miners of Northumberland and Durham* (1816), 70.

at Whiston for the payment of 7d. a wain-load;¹ and in 1726 a colliery at Derby was let for 99 years in return for 1s. a stack of hard and 6d. a stack of soft (small) coal obtained.² In such cases the proprietor usually appointed an official to guard his rights. In 1737, when John Marsh of Little Hulton (Lancashire) let three coal-mines at a rate of 8d. for every pit load of 24 customary baskets, one of the two banksmen was appointed, and apparently paid, by him to give an account of the coal got by each workman.³ But at Farnworth, in the same county, in 1647, it was laid down that the windsman, who acted in this connection for the lessor, should be paid "competent and sufficient wages" by the lessee.⁴ In 1735, at Long Benton, Lord Carlisle had the right to keep at the pits a clerk whose duty it was to take account of the leadings made by the lessees, Sir Henry Liddell and partners; and at Lanchester Moor Colliery, in 1747, the lessor was permitted to send his viewers to inspect the pits while at work, though not more than one visit might be made in a single week.⁵

As the technique of surveying developed less frequent inspection sufficed. In Lancashire, Yorkshire, and the Midlands, where the seams were relatively thin, it became customary to let the coals by the acre, and it was not difficult for the surveyor to calculate the amount of coal removed since his previous visit.⁶ In 1749 John Watson estimated that an acre of coal in a 6-foot seam would produce 143 tens (at 22 waggons to a ten, and 19 bolls to a waggon, and 36 gallons to a boll);⁷ and a modern surveyor may base his estimates of output on the assumption that 120 tons per acre can be obtained for every inch in the thickness of the seam. Where a substantial and varying quantity of coal was left stand-

¹ *Norfolk MSS.*

² *V.C.H. Derby*, ii. 355.

³ H. T. Crofton, "Lancashire and Cheshire Coal-mining Records", *Trans. Lancs. and Ches. Antiq. Soc.* vii. 45.

⁴ Hart-Davis, *op. cit.* 232.

⁵ *Journal of John Watson.*

⁶ Farey, *Gen. View of Derbyshire* (1811), 182.

⁷ *Journal of John Watson.*

ing in pillars such calculations would be difficult, and this is perhaps the reason why acreage rents are not found in Northumberland, Durham, Cumberland, or Scotland, where bord-and-pillar working was the usual practice. In Lancashire, Yorkshire, and parts of the Midlands they are common even to-day; and in the eighteenth century Yorkshire in particular affords many examples.¹ At Low Moor, near Bradford, a lease of 1774 fixed the royalty at £53 an acre, payable "upon the getting of the first scoop of every acre of the Low Bed Coal"; in 1781 there was a certain rent of £24 and a payment of £48 for every acre after the first half-acre had been worked; and in 1792 the same lessees agreed to pay for coal at North Bierley the sum of £50 "until they shall have paid . . . so many sums of £50 as there are acres of land in the said farm to be measured on the surface".² Similar acreage rents are found in the south of the county. In 1786 at Chapeltown £35 an acre was paid for one seam, and £115 for another.³ In 1805 the Duke of Norfolk leased Sheffield and Handsworth Collieries on the basis of £750 for 18 acres, whether this quantity of coal were actually worked or not in any one year. And in 1811, according to Farey, colliery rents in Derbyshire varied from £50 to £180 an acre.⁴

Occasionally the owners of mineral rights were anxious for larger immediate incomes and were not much concerned for the future of their estates. In Durham, "individual rectors, having found coal under their small glebes, are working it out against their own lives, and impoverishing the livings for their successors". Most royalty-owners, however, even when clerics, took a longer view, and, as a safeguard against a premature exhaustion of their minerals, imposed some limitation on working. Sometimes a maximum was set to the daily

¹ *Royal Comm. on Mining Royalties, Final Report* (1893), 4.

² *Low Moor MSS.*

³ *Norfolk MSS.*

⁴ *Norfolk MSS.; Agric. of Derbyshire, loc. cit.*

or annual output, as when, in leasing mines at Whickham in 1356, the Bishop of Durham stipulated that not more than a keel-load a day should be drawn from each pit.¹ Sometimes a restriction was set to the number of pits that might be opened at any one time: at a Scottish colliery in 1572 the tenants were confined to "ane eye and ane coilpot";² and in the early seventeenth century lessees at Stratton in Somerset were forbidden to work more than two pits at once.³ Sometimes, again, a closer limitation was imposed by fixing a maximum to the number of colliers that might be employed: at Saltcoats, in 1699, it was laid down that not more than fifty hewers should be put to work,⁴ and at Sheffield and Attercliffe Collieries in 1737 the lessees agreed not to make use of more than fifteen master coal-getters with their usual assistants.⁵ When no such maximum was set the rent was sometimes made to vary with the number of men employed, as in 1779, when John Swallow agreed to pay the Earl of Surrey twenty guineas a year for each pitman at work in Parkin Wood Colliery, Ecclesfield. And, occasionally, the coal that might be worked was limited to that needed for a particular purpose, as at Chapeltown in 1786, when the same lessee was confined to such a quantity as he should require for the use of his ironworks.⁶

There was a strong temptation for a lessee to concentrate work on the more accessible coal and to neglect the less easily worked, or disturbed, seams. "If you doe sett the coal the tacksman must be obliged to carry up the levell roome and other roomes troulie [wrote Sir Peter Halkett of Pitfarrane in 1725⁷] otherwise he may loss of the levell and pass over some pairts to take away the best of the coall and leave it in disorder at the end of the tack if he is not tied down". Generally the tendency

¹ *Mid. Min. Comm.*, 1st Report (1843), cvi.; Galloway, *op. cit.* 45.

² *Trans. Inst. Min. Engrs.* vi. 384.

³ *V.C.H. Somerset*, 380.

⁴ *Scot. Hist. Rev.* xix. 90.

⁵ *Trans. Inst. Min. Engrs.* lxxv. 90.

⁶ *Leases in Norfolk MSS.*

⁷ *Hist. MSS. Comm.*, Drummond Moray MSS. 153.

was to work out the coal near the surface and leave the deeper coal alone, and this had to be checked by special clauses in the agreement: at Sheffield Colliery, in 1692, the lessees undertook "not to gett at above 2 pitts, nor with above 10 getters, to leave 2 pitts in good work, and to carry on the deep work equal with the Bassett".¹

On the other hand, the landowner desired some safeguard against failure to work the minerals for a period and against the lessee's retaining possession of the mines after the coal had been exhausted. A simple royalty gave no such guarantee, and special provisions were commonly made to meet the danger. In a lease of coal at Herinthorpe Manor in 1707 the Duke of Norfolk stipulates that the lessees shall pay 7d. for every wain-load, "and shall and will gett all the Coles they can with a reasonable charge in the said Waist grounds in the said time".² Generally, however, reliance was placed on the sanction of money payment: a certain rent covered the right to work a stated output, and was payable whether this was actually obtained or not, and, in addition, a royalty was paid on each unit of coal worked above this amount. The lessee was thus given an incentive to attain at least a minimum output. Examples are easy to find in the Northern Coalfield. In 1675, mines in the township of Whitley in Northumberland were let at a fixed rent of £50 a year, with an additional payment of 7s. 6d. a ten for every ten over 134;³ and in 1734, at Gateshead, a royalty of 15s. a ten was payable, with a minimum of £300, equivalent to an output of 400 tens.⁴ About the middle of the century a Shropshire landowner, on leasing coal-mines to the Coalbrookdale Company, subject to the payment of 1s. 10d. a stack, imposed the condition that the sum handed over each year should never fall below £150.⁵ And, to give an example from Scot-

¹ *Norfolk MSS.*

² *Norfolk MSS.*

³ Galloway, 131.

⁴ *Watson Coll.* 3046.

⁵ *Coalbrookdale Account Book*, 1754-62, fol. 58.

land, the proprietor of Leven Colliery (Fife) in 1804 asked a rent of £1100 for coal and ironstone sufficient for the consumption of one blast furnace, with an additional royalty on any further working.¹

When the actual output of a colliery was such that the royalty payable in any one year was less than the fixed rent, the difference was termed "shorts", and the lessee was sometimes allowed to deduct it from the sums payable for output in excess of the minimum in subsequent years. A year of large output might thus be set off against a previous year of small output without any payment of royalty. In the Gateshead lease of 1734 it was laid down that if the holders of the colliery failed to take out the whole of the 400 tens in any one year they might obtain the deficiency without further payment at any time within five years; and under the Lanchester Moor Colliery lease of January 1749/50 the tenants were given one year after the end of the term in which to make up shorts.²

The combination of a fixed rent with a tonnage royalty beyond a minimum output generally proved satisfactory to both parties. But when unexpected difficulties in working made it impossible to reach the minimum output—or when trade depression made it impossible to sell it—the lessees sometimes wished for a revision of the terms. Provision for suspension of payments in the event of war or pestilence or the exhaustion of the coal was made in a Sheffield agreement of 1737. But usually the lessees had no such protection, and when emergencies arose they had to rely on the generosity of the landlord. In 1749, to give a single example, the partners in Long Benton Colliery sought relief from terms which had proved more onerous than had been anticipated, and Lord Carlisle agreed to a reduction of the certain rent from £900 to £750 for two or three years: when the partners should be in a position to work

¹ Advertisement in *Sheffield Iris*, February 7, 1804.

² *Watson Coll.*

more than a single pit at a time, the original lordship of £900 for 1200 tens was again to be paid.¹

Naturally the difficulty was most commonly experienced where a simple fixed rent was charged, and the low selling prices of periods of depression were frequently intensified by the necessity of disposing of sufficient coal, even below cost of production, to meet the claim of the landlord.² An obvious remedy would be to charge no dead rent and to make the royalty vary with the value of the output. This, indeed, was the practice in the Forest of Dean, where the free miners held their pits subject to the ancient right of the Crown to enter a fifth man, that is, to receive one-fifth of the value of the coal worked. But there was clearly no place for a formal lease in an area where the working colliers were also the owners of the pits, and where "every Miner in his last Days and all times may bequeath and give his Dole of the mine to whom he will as his own Cattle, and if he do not his Dole shall descend to his heir".³ In other places, however, where dead rents were imposed, a sliding scale was sometimes applied to the output in excess of the minimum covered by this payment. By the Sheffield and Attercliffe lease of 1737 the holders were required to pay £400 a year for twenty-one years, and also one-fifth of the value of all coal worked in excess of a stated amount;⁴ and at many Scottish collieries, in the second half of the century, the same proportion (one-fifth) of the market price of the coal had to be handed over to the laird, in addition to the fixed rent.⁵ An even more elastic arrangement was when the sum payable to the owner was made to vary with the profits of the undertaking. Thus at Osmond Haigh Pit (Derbyshire) in 1720 the lessor was entitled to receive of Mr. Sitwell,

¹ *Journal of John Watson.*

² *Rept. of Comm. on Manuf. Comm. and Shipping* (1833), ev. of William Matthews, p. 596.

³ *Laws and Customs of the Miners in the Forest of Dean, 1687*, 24.

⁴ *Norfolk MSS.*

⁵ Barrowman in *Trans. Inst. Min. Engrs.* lxx. 90.

the lessee, an addition to the certain rent of £10 in any year in which Sitwell's profit might exceed £50; and when the Duke of Norfolk let a colliery at Attercliffe Common to Vincent Eyre in 1805, he accepted a royalty of one-fourth of the annual profits after an amount had been set aside as interest on the capital of the undertaking.¹

II

In areas where the competition for collieries was small the lessee was not closely hedged about with restrictions. At Barlow in 1763 the Trustees of the Earl of Oxford stipulated that John Barnes should pay a fixed rent of £100 a year; that he should not draw from more than two pits at the same time; that he should make compensation to the occupiers of the surface for any damage done to their lands; that he should make reparation for any cattle that might fall into his pits; that he should pay "all manner of parliamentary taxes, Church and parish Dutys, Levys and Assessments" during the twenty-one years of the lease; and that, at the end of the term, he should fill in the pits and remove the rubbish-heaps to the commons and waste lands. But there was no regulation of methods of work other than that he should carry out his operations in "one regular and proper measure according to the Rules and Methods of working Coal Mines in the County of Derby". And there was no restriction of his right to remove buildings and equipment at the end of the lease.²

In Northumberland, Durham, and Yorkshire, however, the duties of the lessee were often more closely defined. At Jarrow, in 1750, the holders of the colliery were required to invest in it at least £2000; at East Denton, in 1765, they were to spend at least £5000; and at Jarrow again, in 1805, they were to employ at

¹ *V.C.H. Derby*, ii. 354; *Trans. Inst. Min. Engrs.* lxx. 90.

² *Barlow Lease*, in possession of Edwin Barnes, Esq., of Ashgate, Chesterfield.

least £12,000 in an endeavour to win the coal, before the lease might be surrendered.¹ Elsewhere separate rents were payable for the occupation of the surface of the ground: at North Bierley the Low Moor partners were called upon to pay 50s. a year for every acre of land used and taken up by working the colliery until the land should again have been made fit for ploughing.²

On the other hand the tenants of collieries sometimes obtained substantial concessions. By the Jarrow lease of 1750 it was agreed that no royalty should be paid on coal used at the fire-engine or at any other fires about the colliery, and that coal not suitable for sale by water should also be exempt. At Bychton Colliery (Flint), in 1822, all engine-coal was similarly free of royalty. In other cases, however, the proprietors set a limit to the quantity of such free coal. At Lanchester Moor, in 1750, the lessees were permitted to get coal for their own domestic use and that of their workmen up to, but not exceeding, five tens; and at Gateshead, in 1795, the free coal was not to exceed one-sixteenth of the total vend of the colliery. Where acreage rents were charged no such concession has been found, and, even where tonnage or tentale rents were the custom, it was by no means universal. At Pontop Pike Colliery, in 1760, the proprietor expressly stipulated that royalty should be paid on coal used by the lessees and their workmen, and in 1806 the Dean and Chapter of Durham required the full royalty of 20s. for every ten of coal used by the drawing engine.³

Another concession to lessees was exemption from royalty during the early years of a lease. In proposals made to the Duke of Devonshire by Messrs. Smith, Bradley, and Taylor in 1775 for a twenty-one-year lease, it is pointed out that the first three years would be taken up in draining the coal, and the would-be lessees suggest that they should pay no rent during this period.⁴

¹ *Watson Coll.* 3038.

² *Low Moor MSS.*

³ *Watson Coll.* 3059, 3072; *Manor Wallsend Repts.*, 1801-1838; and *Watson's Journal*.

⁴ *Devonshire MSS.*

Again when Killingworth Colliery was let for 63 years from 1801, the lessees were freed from royalty during the first three years when the coal was being won. In 1750, at Jarrow and Gateshead, it was proposed to reduce the rent from £40 to £10 during the first three years; and for the first two of the 21 years of the East Denton lease of 1765 a rent of £100 for 62½ tens took the place of the £200 for 125 tens of the remaining years. At the Kinmount Mines (near Annan) in 1818 no dead rent was to be paid for the first year, but a charge of 7d. a ton was levied on output; and at Bychton (Flint) in 1822 the lessor waived his claim to a dead rent for the first year, but received instead one-eighth of the value of the coal obtained.¹

The holder of a colliery often sought the right of surrender if it became impossible to continue work except at a loss. A clause in a Sheffield lease of 1737 providing for cessation of payment of dead rent in war or pestilence has already been mentioned.² At Long Benton, in 1735, the lease was determinable if the colliery were drowned out or became overcharged with foul gas;³ and John Barnes of Barlow had the right of ceasing payment if the coal should be worked out before the expiration of the lease.⁴ Where long engagements were entered into it was often agreed that the lease might be surrendered, subject to due notice, at periodic intervals. When an agreement for 92 years was signed at Long Benton in 1742, the holder was given the right of withdrawal at the end of the eighth, or any subsequent, year, provided three years' notice were given.⁵ At Kenton Colliery, where a lease for 31 years was granted, the tenant might give twelve months' notice to surrender at the end of the second, fourteenth, twenty-second, or twenty-eighth year; and the lease of Tyne Level Drift of the same year was determinable at the end of 2, 9, 16,

¹ *Watson Coll.* 3059, 3038, 3072.

² Sorby in *Trans. Inst. Min. Engrs.* lxx. 90.

³ *Watson Coll.*

⁴ *Barlow Lease.*

⁵ *Watson Coll., Killingworth and Long Benton Reports*, 1734-1813.

or 23 years.¹ On surrender, the colliery and its buildings became the property of the landlord, and it was usually stipulated that the shafts and watercourses should be left in good condition. Frequently, however, as at Lancaster Moor Colliery in 1749, it was agreed that the engines, ropes, rails, and waggon-ways might be removed by the lessees; and sometimes any equipment left behind was purchased by the landowner at a price fixed by impartial viewers.

Owners of land in colliery districts often drew substantial revenues from the coal masters by the grant of underground wayleaves and the right to use shafts that had been constructed for other collieries. Where the whole of the workings were owned by a single landlord such payments were rare, for an attempt to exact wayleave rent and shaft rent would simply have reduced the amount of dead rent and royalty offered by the prospective lessee. Where, however, the holder of a mine had also taken a lease of an adjoining royalty belonging to another landlord, he might wish to bring coal through the first mine and up its shaft, instead of going to the expense of sinking a second shaft. For transporting the coal through the barrier between the two mines he could be called upon to pay an *outstroke rent*, for carrying it underground to the shaft a *wayleave rent*, and for raising it to the surface a *shaft rent*.² Moreover, since the driving of outstrokes might easily damage a colliery by making possible an influx of gas or water from neighbouring workings, in many leases clauses were inserted to prohibit it unless permission were expressly given by the lessor. The Long Benton lease of 1742 required that a barrier of forty yards should

¹ *Ibid.* 3023. At Coxlodge Colliery, in 1796, the periods at which a thirty-one-year lease might be given up were at the end of 5, 14, 21, and 28 years, and at Bychton, in 1822, Sir Thomas Mostyn had the right of surrender at the end of 5, 7, 9, or 11 years, subject to six months' notice (*Watson Coll.* 3072).

² W. R. Sorley, "Mining Royalties and . . . the Iron and Coal Trades", *Stat. Journ.* lii. 67.

be left, and that if, with the permission of the lessor, drifts were made in this barrier they should be stopped by dams if there were any likelihood of damage.¹ Sometimes, as at East Denton in 1765, the payment made for outstroke was a simple rent—£5 a year in this instance—but it was more usual to make a tonnage charge on coal carried through the barrier. Thus at Tyne Main in 1776 the payment for outstroke was 9s. a ten. Obviously, if, in addition, a charge were made for underground wayleave, and for use of the shaft, the outstroke rent would have to be reduced *pro tanto*. Nevertheless, some proprietors preferred to make a separate charge for each right. At Kenton Colliery in 1790, for example, there was an outstroke rent of 2s. 6d. a ten and also a shaft rent of the same amount; and at Killingworth in 1801, 3s. a ten was payable for outstroke, 3s. for underground wayleave, and 3s. for shaft rent on all “foreign” coal. At Jarrow in 1805 there existed a differentiation according to the ownership of the waggons in which the coal was moved below ground: 1s. 3d. a ten was exacted, as outstroke rent, on coal led in waggons belonging to the colliery making the charge, and 3s. 9d. on coal in waggons belonging to others.²

Of greater importance were the surface wayleaves which proprietors were able to charge for the passage of coal over their land to the high-road, the river, or the sea-coast. Where the ground over which passage was required was owned by the proprietor of the colliery concerned there was nothing to be gained by demanding a separate fee for wayleave. In some leases, therefore—such as that of Cal Glas in 1757, and that of East Denton in 1807—it is expressly laid down that the coal may be carried to the highway or to the staithes on the river free of charge.³ Where, however, carriage was required over land in different ownership the wayleave payments were sometimes as high as the royalties paid

¹ *Watson Coll.* 3038.

² Documents in *Watson Coll.*

³ Palmer, *John Wilkinson*, 31; and *Watson Coll.*

to the proprietor of the colliery. In the north of England the owners of grounds between the pits and the shipping points on the Tyne and Wear were able to acquire considerable fortunes from this source. Describing "a small common not exceeding 300 yards over", a pamphleteer of 1739 says, "The herbage of the whole common is not, nor ever was, worth 20s. per Annum. For lease of a Way over this small Pittance of Ground, otherwise almost useless, the late Mr. C——, as I am credibly informed, received annually for some years, above 2500l'". And for a wayleave over Whickham Moor more than £3000 a year was paid at the same time.¹

Sometimes wayleaves were purchased outright by colliery owners for reasons of business strategy: the Grand Allies of the Tyne, for example, bought up many, and paid dead rents for others, so as to be able to force landowners whose coals were at some distance from the river to grant leases to the allies on favourable terms. Again the possession of a wayleave could be used to put an end to the operations of a rival where there was only one possible route to the market; and this power was exercised effectively in more than one coalfield during the seventeenth and eighteenth centuries.²

III

The rents and royalties obtained by mineral owners were naturally subject to wide variations depending on

¹ *Enquiry into the Reasons of the Advance in the Price of Coals* (1739). See also Farey, *op. cit.* iii. 285.

² *Ibid.*, and *Acts of the Privy Council* (1601-4), 214. Wayleave charges varied widely from place to place. At East Denton Colliery, in 1765, the charge was 1s. 6d. on coal which paid a royalty of 32s. a ten. At Kenton, in 1790, a fixed rent of £100 a year was imposed for wayleave and watercourse rights, and this would not amount to more than 3s. 6d. on the minimum output, as against a royalty of 17s. 6d. a ten. At Coxlodge, in 1809, there was a shaft rent of 2s. 6d. in addition to a wayleave rent of 2s. 6d., and a royalty of 18s.; at Duckham's Hall, in 1811, outstroke, shaft, and wayleave rents were each 2s. 6d. against the royalty of 18s.; and in 1821, at South Shields, where the outstroke, shaft, and wayleave charges were also 2s. 6d. each, the royalty varied from 21s. to 30s. a ten (*Watson Coll.* 3038, 3023, etc.).

the depth and thickness of the seam, the quality of the coal, and the distance of the colliery from the market. Generally, as at Derby in 1726, a lower charge was made for soft (or small) than for hard (or large) coal; and this form of discrimination sometimes encouraged the lessee to take a greater proportion of the output in the more cheaply rated form. In 1808, for example, the holders of Aberpergwyn Mines in South Wales were hauled to court for having habitually broken large into small coal so as to escape with a royalty of 3d., instead of one of 1s., a ton. Nearly £5000 had to be paid as compensation to the proprietor.

Such variations make it impossible to generalise with safety as to the proportion of the product of the industry that passed to the landowners, but it was undoubtedly, according to modern notions, high. In 1754 the Coalbrookdale partners were paying 1s. 2d. a stack on coal valued at 4s. 6d.: the proprietor obtained 26 per cent of the value of the coal.¹ Three years later, at the Lawley and Dawley Collieries, royalties of 1s. 7d. and 1s. 10d. a stack were paid on coal for which the Horsehay Company gave the charter-masters 2s. 8d. and 2s. 11d.; and at the same collieries in 1774 the royalty was 2s. 6d. a waggon-load and the charter-master received 5s. 3d. In 1778, however, the royalty was reduced to 1s. 6d. and the charter-masters' price remained unchanged.²

In other parts of the country the royalty was generally less than in these outcrop mines of Shropshire. At Whinney House in Durham, in 1761, 5d. a corf was paid on coal which sold at 4s.; at Coxlodge, in 1804, 1s. 5½d. on a measure of coal valued at 14s. 4d.; and at Tyne Main 1s. on coal priced at 12s. 2¾d.³ At Chapeltown in South Yorkshire, in 1796, the royalty owner took 8d. on coal which sold at 7s. 11d.;⁴ and at

¹ *V.C.H. Shropshire*, i. 463.

² *Horsehay Account Book*, 1754-62; *Waste Book*, 1774-81.

³ Papers in *Watson Coll.*

⁴ *Norfolk MSS.*

Mold in Flintshire, in 1825, the royalty was 12½ per cent of selling price.¹ But even these charges, varying as they do from one-eighth to one-twelfth of the sale price of the product, are large compared with the one-fortieth part of the value of the coal, which, according to the Royal Commission of 1925, goes to the proprietor of the minerals in our own day.²

Many of the earlier leases set no term of years: sometimes the colliery was held under a yearly tenancy without written agreement; and sometimes, as at Farnworth in 1647, the lessee was given the right to work the pits "soe longe tyme as cole or cannell maie bee conveniently gotten there".³ Generally, however, a period was fixed, and when the discovery of profitable seams was anticipated the landlord naturally preferred a short lease. It was necessary, however, for the term to be long enough to encourage the lessee to sink sufficient capital in the mine and to exploit fully any beds of coal he might come upon. In eighteenth-century conditions a period of twenty-one years was evidently considered adequate; for of 66 instances of which particulars have been noted 32 were of this duration.⁴

Under long-term agreements, at fixed rents, the lessees might find themselves in difficulties if adverse changes occurred in market conditions. The Grand Allies—the Ravensworth, Strathmore, and Wortley families—had obtained leases of wide areas of coal about Newcastle in the earlier part of the eighteenth century; "but improvements of the steam-engine, and the application of cast iron to the various purposes of mining, produced a new era, paving a way to the opening of those extensive and valuable collieries below Newcastle, in the Wallsend seam, and the deeper collieries upon the river Wear; whilst the monopolists were saddled

¹ Papers in *Watson Coll.*

² *Rept.* pp. 3 and 81.

³ Hart-Davis, *op. cit.* 231.

⁴ Six were for shorter periods, 11 for periods exceeding twenty-one but not exceeding forty-two years, and 17 for longer periods.

with long and costly leases, of which they were not able to rid themselves for many years afterwards".¹

More frequently, however, with the increasing prices of coal that marked the century, the value of the right to work pits tended to increase; and in some of the longer leases provision was made for the proprietor to share in the anticipated good fortune. Such was the object of the sliding-scale, of which instances are found in Scotland, Yorkshire, and North Wales; and where it was not thought desirable to make the tentale rent vary directly with selling price or profits, it was possible to make provision for an increase of rents and royalties in the later years of a long tenancy. When, for example, the Earl of Carlisle granted Long Benton Colliery to the Grand Allies in 1735 for 99 years, the dead rent and tentale rent were fixed at £400 and 13s. 8d. respectively for the first six years; at £600 and 13s. 8d. for the next six years; at £900 and 13s. 8d. for the next twenty-eight years; and at £900 and 15s. for the remainder of the lease.²

Where the landowner showed no such prevision, the holder of a colliery under a long agreement sometimes found his profits augmented by large windfall gains. How large, indeed, these might be is shown by the increase in rents demanded on renewal when long leases fell in. A colliery let by the Duke of Norfolk in 1737, for example, at a rent of £400 a year, was relet (with, it is true, a slight increase in acreage) for £6000 a year in 1805.³ In South Wales Anthony Bacon obtained in 1747 a lease of land and minerals for 100 years at a fixed rent of £100 a year; and the fortuitous gains which came to him and those to whom he sublet the property are reflected in the annual rent of £20,000 demanded when the old lease expired and a new one was made in 1847.⁴ A grant for an even longer

¹ Dunn, *View of the Coal Trade* (1844), 43.

² *Watson Coll.*

³ Sorby in *Trans. Fed. Inst. Min. Engrs.* lxx. 90.

⁴ *Trans. Inst. Min. Engrs.* vi. 14.

period than this was obtained by the Duke of Bridgewater in 1763, when he acquired the minerals under the Downes' Estate at Dickson's Moss for the term of a thousand years. On the death of the Duke in 1803, the Bridgewater Trust was created to maintain his widespread undertakings as a unity for a hundred years; and in 1809 the trustees bought outright the Dickson's Moss estate.¹ Our remote descendants were thus deprived of the sensation which the terms of renewal might otherwise have created in the year of Our Lord 2763.

In these instances there is no suggestion that the proprietors were wrongfully deprived of part of the value of their minerals: they were in a position to bargain on equal terms with the other party, even though he might be a person of consequence. Sometimes, however, a powerful industrialist was able to exert undue influence over the owner of the property. In 1742 Sir James Lowther (afterwards the "Bad Earl" of Lonsdale) induced the Governors of St. Bees school to grant him a lease, for 867 years, of all their coal at the absurdly low rental of £3:10s. a year.² The mines proved highly productive, and in 1819 the Charity Commissioners instituted an inquiry which elicited the fact that, at the time the lease was granted, both Sir James and his steward, John Spedding, were themselves Governors of the school. The Attorney-General took proceedings, and, after a protracted suit, the successor of the delinquent was obliged, in 1827, to pay £13,280 in additional royalties, and to accept a fresh lease the terms of which were settled by disinterested viewers.³ In another matter the Lowthers benefited from the unwariness of the public officials, though here there was no suggestion of sharp practice. On the advice of Carlisle Spedding, in 1729 a pit had been sunk at

¹ Hart-Davis, *op. cit.* 231.

² The heads of the lease are set out in *Watson Coll.* 3093.

³ R. W. Moore in *Trans. Inst. Min. Engrs* vii. 615, 628.

Saltom on the sea-coast within twenty yards of high-water mark, with the object of working the beds of coal beneath the sea. Since it was not until 1860 that the Crown established a claim to royalties on these workings, several generations of Lowthers were enabled to reap rich harvests from the prescient sowing of their ancestor.

CHAPTER XII

THE SUPPLY OF COAL TO LONDON

Then shall it be for a man to burn: for he will take thereof, and warm himself; yea, he kindleth it, and baketh bread.

ISAIAH xliv. 15.

THE presence about the highways of the Tyne and Wear of rich beds of coal suitable for domestic use gave rise to an early development of trade with London; and the absence of proper means of inland communication with the metropolis made impossible any serious competition from other coalfields in this most profitable of markets. In 1745 the exports to London from the North exceeded half a million tons. During the following twenty years the average amount of coal received from ports other than those of Northumberland and Durham did not exceed 7000 tons; and as late as 1805 only 2580 tons reached London by inland carriage.¹ Inland coal, it is true, was generally inferior in quality to the standard grades sent from the Great Northern Coalfield, especially after the adoption of the practice of "screening" by the northern coal-owners in 1766. And London dealers, who had vested interests in the sea-borne trade, discouraged imports from other coalfields.² Nevertheless, it is manifest that the causes of the predominance of northern coal in London were mainly geographical, and it was not until after the construction of thousands of miles of canals and railways that the monopoly of Northumberland and Durham was broken.

The carriers and dealers concerned in the trade

¹ *Report of Coal Comm.* (1871), iii. 14-26, 63; see also Scott, *Epitome of the Trade to London* (1869).

² *Rept. on the Coal Trade* (1800), 566, 640-48.

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formed a complicated chain, some of the links of which were rusted by antiquity and weakened by craft regulations and restrictive laws. It will be well first to describe the principal classes of middlemen, and then, at the expense of some repetition, to consider some of the problems to which the involved methods of marketing gave rise.

First in order stood the *fitters*, whose business it was to transfer supplies from the coal-masters to the ship-owners. The coal was delivered by waggons at the staithes, or piers which projected into the river, and it was the business of the fitters to transport it to the ships in keels. In the early seventeenth century this work had been performed by factors, who were simply employees of those coal-owners who dominated the Gild of Hostmen; but by 1650 there had come into being a number of gildsmen who were willing to act as fitters for the growing body of unfree coal-owners. In a document of 1651 "factor" and "fitter" are used interchangeably,¹ but by 1703 the term "fitter" alone is used.² The change of name reflects an extension of function. For though the fitters did not buy stocks on their own account, and were still agents between the coal-masters and the ship-owners, they guaranteed to the one delivery of coal of agreed quality, and to the other payment of the stipulated price. They had also the duty of obtaining all documents relating to the cargo and of paying the dues and charges imposed at the loading ports. To the price of the coal they added a sum for the use of keels and appliances, a further sum for the beer allowance—and sometimes for a bread allowance—to the keelmen, and yet another for the customs duties; and they then presented the whole as a bill to the ship-owner.³

The keels used in earlier times are described as "carvel-built vessels, with a square sail and peculiar

¹ In a gild order of that year. *Trans. Surtees Soc.* cv. 92.

² When the Hostmen consulted the Attorney-General on their charter. *Ibid.* 162n.

³ *Rept. on Coal Trade* (1800), App. 543.

oars"; later they were "clinker-built wherries, carrying in most instances a fore and aft sail"; but in the middle of the eighteenth century their rig consisted of one long sail.¹ The coals were carried in bulk in the hold, from which they could readily be cast through the low port-holes of the sea-going colliers. The capacity of the keels was fixed by law,² for they were used to measure the cargo: each was required to carry 8 Newcastle chaldrons, and as the chaldron weighed $52\frac{1}{2}$ or 53 cwts., the weight of the keel-load would be about 21 tons. No actual weighing took place: the method of ascertaining that the keel was properly laden was simply that of filling in coal until a painted line on the hull was level with the water—a practice that gave greater measure when keels were loaded in sea-water than when loaded in the river.³

The *keelmen* were a hardy race, drawn largely from Scotland, whither many of them returned to visit their families during the winter months.⁴ In 1712 there were about 1600 of them, but their numbers grew, for in 1825 there were said to be 800 keels, each with a crew of four men.⁵ Like the northern pitmen, they were required to enter into yearly bonds with their fitter employers, and on "arling" they received a sum as binding money (which was supposed to cover house rent) and also a guinea for a binding supper.⁶ When at work they received a customary allowance for beer and bread. Wages naturally differed according to the work done, for the keelmen were divided into the two classes of skippers and common shovelmen. In 1770 earnings did not exceed £23 or £24 a year, and, since the keelmen were paid by the tide, their weekly takings were sub-

¹ *Trans. Surtees Soc., loc. cit.* 1; Dunn, *View of the Coal Trade*, 43.

² By 30 Car. II. c. 8, and 6 & 7 W. III. c. 10.

³ Edington, *op. cit.* 199.

⁴ *A Further Case Relating to the Poor Keelmen* (1712).

⁵ *The Case of the Poor Skippers and Keelmen*, and *A Further Case. Hist. MSS. Comm., Portland MSS.* vi. 105.

⁶ *Memo. of Agreement between the Owners of Ouston Colliery and the Keelmen*, December 24, 1819, *Bell Coll.* xxii.

ject to wide fluctuations and there were frequent periods of severe unemployment.¹

In the eighteenth century there is no sign of the gild in which they were organised at an earlier period. But that the spirit of fellowship was strong is shown by the unanimity with which they turned out in industrial disputes, by their attempts to provide a hospital for sick, aged, and unemployed keelmen, and by their social habits. "These people [wrote Lord Harley²] have a peculiar manner of giving a pledge for their standing by one another upon any occasions; which is by spitting upon a stone, as they lately did because of affront given to one of them by a person who kept a public house on the north side of the Tyne. The keelman that was injured went and spit upon a stone near the house and renounced any further connection with it, and the rest that were of his mind performed the same ceremony. And they kept so religiously to their vow that the people were obliged to quit their house for want of business".

The keelmen had many grievances. The plan for a hospital was first put forward in 1699, when it was agreed that their employers should retain fourpence per tide per keel for the purpose, and building was actually begun in 1701. A few years later, however, complaints arose of mismanagement of the funds by the employers, and an entire stop to the trade resulted in 1710. If a petition of the keelmen may be trusted, a sum of no less than £2530, which had accumulated by 1704, had been whittled away by the hostmen managers. After 1729 the contributions ceased, and the project seems to have lapsed until 1788, when an Act of Parliament authorised a levy of 1d. per chaldron per keelman for the purpose.³

In 1750 the men were again at war with their employers—this time because of an attempt to make them carry an excessive load without any increase of pay; and

¹ *J.H.C.* xxxii. 777.

² *Hist. MSS. Comm., Portland MSS.* vi. 105.

³ *The Case of the Poor Skippers and A Further Case.*

in 1770, when hundreds of bound keelmen were said to be leaving their masters, a petition was sent to Parliament asking that the load be restricted to 8 chaldrons.¹

The keelmen were never economically strong. If they ceased work some coal could always be shipped without their aid. During the seven weeks' strike of 1750, for example, sailors took to loading the vessels;² and after about 1780 the collieries that were opened below the Tyne bridges were ceasing to make use of keels and were loading the coal into vessels by means of "spouts". The struggle between the keel and the spout was long-drawn; it was the cause of much unemployment of keelmen, and it gave rise to serious disturbances in 1819 and 1822. The story falls outside the period of this volume, but since the keelmen took their stand on the ground of custom it may be worth while to glance at the demands put forward and the settlements reached in these years.

The protest of 1819 against the spouts was based on the well-worn plea that the keels were a nursery of seamanship, and that the spouts were an obstruction to navigation on the Tyne. It was made the occasion for a ventilation of other grievances; and when the men returned to work at the end of the strike the employers agreed that payment should be made for overloading of keels, and that in future the load should not exceed 8 chaldrons. Henceforth the bonds were to be printed and a duplicate was to be given to each man; wages were to be paid in cash, and keelmen were not to be compelled to spend money on beer at the staithes; and when vessels with high port-holes were loaded the master of the ship was to be required to pay 1s. per keel for each foot, in excess of five, between the gunwale of the keel and the port-hole of the collier. It was agreed that in the matter of the spouts an appeal should be made to the Common Council.³

¹ *Gentleman's Mag.* (1750), 233; Brand, *Hist. of Newcastle*, ii. 304; *J.H.C.* xxxii. 644, 709, 775-9.

² *Gentleman's Mag.*, *loc. cit.*

³ *Bell Coll., Guard Book*, xxii.

Three years later the keelmen protested that they had been able to procure neither an audience nor an answer from this body; and the "long stop" (from October 1 to December 16) which resulted was marked by violent attacks on those keels which were still on the river.¹ The men asked that the quantity of coals taken in at the spouts be limited to six keels for each vessel; that the binding money, which had been discontinued, should again be paid; and that a rent charge of 1s. 6d. a tide, which some fitters had imposed, should be given up.

The settlement ultimately reached recognised the necessity of reducing the number of keelmen in view of the newer methods of loading. To absorb the unemployed an additional man was to be put into each keel, and steps were taken to lessen the number of potential keelmen by reducing the number of boys employed. Appeals by the men against the spouts at the York Assizes, and again at Newcastle and Carlisle, were unsuccessful, and their use gradually extended. Only slowly, however, did the keel give way; for the increased size and draught of the colliers of the nineteenth century prevented their loading more than a small part of their cargoes by the spouts, and at no time could spouts be used above the bridges. It was not until after 1863 that the keelmen ceased to play a part in the trade in coals.²

After loading was finished the fitter's interest in the cargo ceased, and the next step in the process of marketing was controlled by the *Master of the Ship*. The collier vessels were of relatively small tonnage. In 1702 the average capacity was estimated at 140 tons; in 1789 at between 150 and 600 tons; and in 1813 at 220 Newcastle chaldrons, or about 580 tons.³ In 1787, it was

¹ Stones were flung from the river-banks at the keels and at the marines who were guarding them.

² For a full account of the men's case see *Four Addresses of the Keelmen of the Tyne* (1825); Tim Tunbelly, *Nuisances on the River Tyne*; and cuttings in *Bell Coll.*, *Guard Book* xxii.

³ Stephenson, *Observations on the Coal Trade*, i.; and Edington, *op. cit.* 83.

said, a representative collier would carry a crew of ten or twelve (one man to every score of chaldrons).¹ The cost of running a ship was thus sufficiently low to allow of a large number of separate proprietors, and it is evident that it was the practice for each master to own a single vessel.² In 1699 the number of colliers was estimated at 1400; in 1702 there were said to be 1277; in 1730 over 1000; in 1789, 1300; while in 1800, when the coal fleet was small because of requisitions and losses in the war, there were 597 vessels in the trade.³

The masters of the colliers were called on to pay the coast duties and contributions towards the upkeep of the lighthouses; they had to find wages and subsistence for their crews, and to purchase ballast for the return journeys. They were obliged to set aside sums for repairs and insurance, and to pay commission to the factors who sold the coal on their behalf in the London market. Their functions included a considerable element of risk-bearing, for adverse winds sometimes delayed the arrival of the vessels by weeks, and on occasion the Thames was frozen over. For these reasons it was customary to lay up the ships during the months of December and January, and sometimes for a longer period; so that the maximum number of voyages did not exceed eight or twelve in the year.

In periods of war vessels were commandeered and crews pressed to serve with the fleet; and since convoys were not always adequate there were losses by capture.⁴ Pepys⁵ noted that London prices were greatly advanced by the dearth of coal ships in 1666-67; and a House of

¹ *A Letter from a Master of a Collier* (Bell Coll.).

² In 1787 there were said to be 1000 owners, and in 1789 another estimate puts the number at 700. See A Well Wisher, *The Prefatory Part of a Plan . . .*; and Stephenson, *loc. cit.*

³ For 1699, *The Mischief of the Five Shillings Tax on Coals* (Brit. Mus.); for 1702, Brand, *op. cit.* ii. 677; for 1730, *The Case of the Owners of Ships in the Coal Trade* (Guildhall); for 1789, Stephenson, *op. cit.*; for 1800, *Rept. on Coal Trade*, App. 632.

⁴ *Hist. MSS. Comm.*, 13th Rept. v. 25; and *Present State of the Coal Trade* (1703).

⁵ *Diary*, December 8, 1666, and June 23, 1667.

Lords Committee reported to the same effect in 1690-91. In 1703, so acute was the shortage of colliers that London retailers had not more than a week's supply in hand, and in the following year the Queen expressed her anxiety about the shortage of fuel.¹ After repeated representations from the shipowners, in 1739 protection from seizure was given by the Lords of the Admiralty to men who bound themselves to the coal fleet. But the eighteenth-century press-gangs paid little regard to certificates of exemption, and showed a special preference for men trained on the colliers.² In June of the following year the masters complained that not only common seamen, but mates and carpenters had been seized in large numbers, and that this (combined with the ravages of a storm a few months earlier, and the commandeering of colliers as transports and tenders) had put a complete stop to the supply of coals to London and the South.³ The protest was probably unavailing, for during the Seven Years' War and the American War there were frequent complaints of the pressing of seamen and the consequent high wages of those that were left.⁴ In 1704 Defoe had observed that 55s. a month had to be paid to the sailors and had contrasted this with the 23s. allowed to seamen in the Navy. In 1729 the average pay of a sailor on a collier from London to Newcastle and back was 35s.; but, so marked had been the upward movement, that in 1777 the masters attempted to fix a maximum wage of 70s.; and it was at this figure that wages stood in 1793. During the French wars there was a further advance. The Committee of 1800 referred to

¹ *House of Lords MSS. V. (New Series), xxxiii. 228; Cal. S. P. Dom., Anne (1703-4), 611.*

² "The difficulties of the navigation in the Coal Trade . . . give the seamen derived from it, in point of skill, expertness, patience of fatigue, and hardship, an incontestable superiority over those drawn from the other maritime trades". *Report (1800), 643.*

³ *S. P. Dom., Geo. II. (1740), 51/12.*

⁴ *E.g. in 1704-6, 1758-59, 1770-71, 1777, and 1783. Hist. MSS. Comm., loc. cit. vi. 223-6; Surtees, op. cit. 206-7; Annual Register (1771), 157-8; Ibid. (1777), 28. Keelmen were also seized for service at sea: in 1783 nearly eight hundred of them purchased protection of the Government (Dunn, op. cit. 25).*

"the combinations that have repeatedly been formed amongst the Mariners for an Augmentation of their wages", and it was said that these were then £10 and £11 a voyage.¹

But if wages were high so also were freights and profits, and it is by no means certain that the owners were made losers when a state of war was declared. Writing in 1803, Edington declared that many captains had acquired riches sufficient to enable them to buy ships of their own, and ten years later the same writer asserted that profits were no less than £700 to £1000 on the basis of nine voyages a year.²

From the beginning of the eighteenth century the coal was sent to London *factors*, who acted on behalf of the shipowners. Previously the owners had sold direct to lightermen-buyers who used to "pay the Masters what they please . . . when there is a great Fleet at Sea, or the Winds Contrary, they make use of it to Settle the Price of Coals".³ Factors, however, had come to intervene between the shipowner and the buyer before 1729. On the arrival of a ship they could take immediate steps to secure its entry to the Pool by procuring the documents which were obtainable only when the customs had been paid. Frequently they supplied the labour necessary for clearing the colliers after the cargo had been sold. And since they were in intimate touch with the market they could secure to the shipowner a better price than he could have obtained by direct sale:

"It is the duty of the Factor who has Coals to sell, to apply to the different buyers at the market, to engage his Coals; which they do either by whole ships, halves, or quarters. When the factors in general have got their Coals engaged, the parties go in treaty for them; the factor in his judgment asking such a price as he thinks may be obtained, the buyer bidding what he thinks the

¹ *Hist. MSS. Comm., loc. cit.* v. 224; Brand, *op. cit.* 310; *Report* (1800), 641; Newcastle Pamphlets (no title), *re* R. W. Brandling (1815), 14.

² Edington, *Essay on the Coal Trade*, 36; *Treatise*, 81-2.

³ *J.H.C.* xxi. 370.

market may be, until at length, by one party rising, and the other falling, they agree on a price".¹

For these services the shipowners paid the factors a commission (normally $\frac{1}{2}$ per cent) on the price realised.² The factors were never a numerous body: in 1743, one of them, John Gibson, carried on nearly a fifth of the business done in London, and in 1800 the whole trade was conducted by twelve or fourteen men. Generally they seem to have acted simply as agents, but towards the end of the period there is evidence that some had personal interests in the coal-ships.³

As already mentioned, the first buyers were known as *lightermen*. Originally they had been mere owners of river-craft and had served the needs of the woodmongers, who had controlled sales in the seventeenth century. How power had passed from the one class to the other is described in a broadsheet of 1730:

"The Woodmongers . . . for reasons easy to be guessed at . . . have lost many of their customers and been in a state of declension . . . owing to . . . their fraudulent dealings whereby they forfeited their Charter, and by the continuance of the said frauds they also lost their reputation and occasioned the consumers . . . to buy in the Pool: who not having leisure to attend the market, as the Lightermen are obliged to do, have thought it fit to leave it to them to buy their coals, and in process of time gave themselves no further trouble than to buy immediately of the said Lightermen".⁴

The men who superseded the woodmongers were organised in a corporation (the Watermen and Lightermen's Company) the constitution of which tended to the concentration of power in a small number of Rulers.⁵ In 1730 this body had complete control of the purchase of coal; but how long the monopoly was retained is not easy to determine, for later writers had the habit of

¹ *Report* (1800), App. 553.

² *J.H.C.* xxiv. 412.

³ *H. of C. Accts. and Papers* (1749-77), 2, 59; *Report* (1800), 551, 560-61.

⁴ *The Case of the Watermen and Lightermen* (1730).

⁵ *Constitution of Watermen and Lightermen* (1732).

applying the term "lightermen" to all who controlled craft on the river.¹ The position of the lightermen buyers was probably strengthened by the replacing of the open market at Billingsgate, in 1769, by a new Coal Exchange in which the membership was closely restricted. In 1787 there were no more than twenty-seven firms acting as first buyers; and evidence of their power is afforded by an agreement they made among themselves, in 1788, not to unload more than 42 London chaldrons a day from the waiting colliers.²

The coal-buyers were given one to three months' credit by the factors. In addition they were usually allowed a trade discount of 2 per cent, and when the cargo was measured they secured the advantage of the legal *ingrain* chaldron: to every twenty chaldrons one was added in order to offset possible deficiencies in the process of measuring. They sold the coal to *second buyers* (men each of whom had his own craft but had not sufficient capital to buy at Billingsgate) and these supplied the *third buyers*, or small dealers and retailers, who met the needs of householders for domestic fuel.³

The gains of the first buyers on their sales were estimated in 1800 to amount to 1s. 6d. a chaldron.⁴ But, since they also owned or controlled lighterage craft, they were able to make an additional profit on lightering. In 1700 the charge for this service was from 9d. to 1s. per score of London chaldrons; in 1729 it was 1s.; and in 1800, 1s. 6d. Over the century as a whole their total profits were probably nearer 2s. than 1s. a chaldron, and a writer of 1813 estimates them at 2s. 3d.⁵

¹ *J.H.C.* xxi. 370, 517; *Frauds and Abuses of the Coal Dealers* (1743), 9 *et seq.*

² *Report* (1800), App. 553-6; *J.H.C.* xlii. 746.

³ *J.H.C.* xlii. 751; *Report* (1800), App. 548, *ev.* Thos. Fletcher.

⁴ *Ibid.* App. 553.

⁵ Povey, *Indirect Practices in the Coal Trade* (1700), 12; Philalethes, *op. cit.* 5; *Report* (1800), App. 553; Edington, *op. cit.* 91.

The work of the journeymen lightermen was to navigate the barges to the colliers, load up a prescribed quantity of coals (usually 21 chaldrons), and then deliver them at the wharves. They were a body of poorly paid workers among whom Irishmen predominated. Like the keelmen of the North, they were required to enter into bonds with their employers; and before they acquired journeyman status they must have served an apprenticeship of seven years.¹

The actual unloading from ship to lighter was done by gangs of sixteen coal-heavers, who shovelled the coal from platform to platform in the hold, and finally into the measuring vat, from which it was tipped into the lighters. An improvement in this crude method was made about 1758, when groups of eight or nine, instead of sixteen, filled baskets, which were raised by a rope to the deck and then emptied into the vat by the leader of the gang. This operation was known as whipping and the men as *coal-whippers*. As early as 1696 a special class of *undertakers* had arisen to provide the labour on behalf of the masters of the ship. Complaints that the undertakers used to "retain men when a fleet came in att 8d. and 10d. per chaldron and make the Owner pay 2s. and 2s. 6d. and 3s.", led the Court of Aldermen to form them into a fellowship and limit their charge to 16d. a chaldron, of which 14d. was to go to the labourers; and the undertakers were also to pay £200 a year to Greenwich Hospital, £100 to St. Thomas's, and similar amounts to St. Bartholomew's and Bethlem.²

Like most dock and riverside labourers, the heavers suffered from intermittent unemployment and from wide fluctuations in earnings. Most of the undertakers were publicans, and there is evidence of much victimisation. At one time, it was said, of every 20s. earned 8s. was stopped on one pretext or another, and the heavers

¹ *Constitution of Watermen and Lightermen* (1732).

² H. Dale, *The Fellowship of Woodmongers*, 136.

were obliged to buy small beer—the work was thirst-provoking—at the price of strong brandy.¹ In 1758 complaints were made that the undertakers had cornered the supply of shovels and were charging the men 1s. a ship for the loan of an article worth only 3s. 6d.² As a remedy for such exploitation an Act of that year³ set up an office under the supervision of the Alderman of Billingsgate Ward, at which the gangs of heavers might register for employment, and through which they were to receive their pay without deductions for liquor or other goods. But although forty-nine gangs registered, the Act proved ineffective; for registration was not compulsory, and the undertakers gave preference to men who were not connected with the office. After petitions of 1762 and 1764 had failed to bring redress, the continued grievances of the Irish heavers, aggravated by the high price of provisions, found expression in the disorders⁴ that marked the passing triumph of John Wilkes in 1768.

An Act of 1770 established a legal wage of 1s. 6d. a score, and forbade undertakers to be connected with victualling; but it was for three years only, and the evils reappeared when it lapsed. Other acts were passed in 1803 and 1807 with similar provisions; but it was not until 1843, when registration was made compulsory, that a satisfactory solution was found. By this time, however, technical improvements in vessels and wharfs were changing both the nature of the work and the character of the labour employed.

Numerous market dues and duties were levied on all coals imported into London, and in order to prevent fraud and evasion a number of men, known as *meters*, were employed to measure the coal in the process of

¹ *The Coal Heavers' Case* (1764).

² *J.H.C.* xxviii. 63, 259.

³ 31 Geo. II. c. 76.

⁴ For a full account see M. Dorothy George in *Economic Journal: Econ. Hist. Supp.* ii. 232 *et seq.*

transfer from the ship to the lighter. According to a pamphlet¹ of 1714 the meters were required "to attend each Coal-Ship and observe the due weight and ad-measurement of coals, to Topp the Vatts, to take an Account of the Coals measured, and to make a due Return thereof in writing to the Coal Office". The vat was a flat-bottomed vessel, round in shape, and smaller at the top than at the bottom; its dimensions were prescribed by legislation,² and its capacity was 9 Winchester bushels. Though "heaped" measure was required, no indication was given as to the size of the heap; and therefore, in order to ensure against any possibility of under-measure, it was ordered that 21 (London) chaldrons were to count as a score. Since, however, the "ingrain" chaldron was given only after 20 chaldrons had been measured there was much uncertainty when smaller quantities were purchased.

The variations of "Pool measure" affected the accuracy of "wharf measure" ashore, where a single bushel measure was used to fill the coal into the legally determined³ sacks of three bushels—sacks of even greater capacity than the inhumanely heavy ones which (to the indignant wonder of visitors from the North) the Londoner of to-day favours, or at least tolerates. Since the London chaldron was equal to $37\frac{3}{4}$ bushels there was some complication in filling a given quantity of coal into the legally required number of sacks, especially as "strike measure" and not "heap measure" was the practice on land.

It was the custom of the City of London to farm out the posts of the principal meters, but to reserve the right to decide the rate of metage on the chaldron. In 1648 a meter's place was rented at £200 a year, in 1691 at £80; in 1743 it realised by sale no less than £4575,

¹ *Answer of the Under-Meters to the Case of the Master Meters*, 6.

² By 16 & 17 Car. II. c. 2, and 12 Anne, c. 7. After 1800 a new measure, the Imperial vat, was introduced. This had vertical sides and was furnished with a movable bow, which could be used to determine the correct heap.

³ By 26 Geo. III. cc. 83 and 108.

and in 1761, £4430.¹ The fifteen principal meters in 1712 employed 60 assistants; but such was the growth of the coal trade that in 1800, 106 assistants were required.² All these were known as sea-coal meters since they were employed in measuring the coals passing from the colliers to the lighters. But in 1746 land-meters were appointed to check the measurement of coal on shore, and the number of these was increased in 1768 and 1786 to cover districts outside the City and Westminster.

Since the number of ships arriving varied greatly from time to time, the work of the assistants, or deputy meters, was intermittent, and some were compelled to resort to other occupations as well: in 1800 many of them, it was said, were also acting as publicans and small shopkeepers.³ In 1714 the assistants were allowed to charge 1d. per chaldron if measured and 2d. if weighed; and in addition were allowed to take six bushels—formerly the perquisite of the Lord Mayor—from each cargo they dealt with.⁴ Towards the end of the century they were permitted a subsistence allowance, and their measuring charge was raised to 3s. per score of chaldrons; and gratuities were frequently made by the masters of the ships, the amount of which varied with the degree of satisfaction at the results of the measurement.⁵ The land-meters, on the other hand, were paid a weekly wage of about 15s., but in the early years of the nineteenth century they, too, were put on piece-wages at a rate of 6d. for every five chaldrons measured.⁶

Both classes of deputy meter were badly remunerated. They had sometimes to pay consideration-money on appointment and were frequently imposed on by

¹ *The Coal Merchant and Shipper*, December 17, 1921, 801; *Hist. MSS. Comm.*, H. of L. MSS., App. v. 302; *Gentleman's Mag.* (1743) 273, (1761) 187.

² *Complaint and Address of the Under Coal-Meters* (1712), and *Report on Coal Trade* (1800).

³ *Report* (1800), App. 558.

⁴ *Answer of the Under-Meters to the Case of the Master Meters* (1714), 6.

⁵ *Report* (1800), App. 642.

⁶ *Coal Merchant and Shipper*, February 4, 1922, 166.

their principals. In 1712 they complained that the meters had defrauded them of $\frac{1}{4}$ d. per chaldron; that the rules governing seniority among the four grades into which they were divided had not been observed; and that promotion had been given in response to bribes. When they insisted on correct measurement they were rated by their superiors as "persons pragmatical and busy-bodies", and they were "over-awed and not permitted to do their duty". Two years later they declared that "after a vatt is filled, the Ship's crew will often sweep off great quantities of Coals, and the Under-Meter taking notice thereof is often in danger of his life for so doing". And "there are particular gangs of Coal-Heavers, whose Business it is to unlade the Ships . . . so unruly (because they gain the Favour of their Masters by slight measure) that no Words or Threats will compel them to fill the Vatts".¹ Some of the merchants habitually paid "winking-money" to the meters so as to get 23 or 25 chaldrons out of a score, and the large number of petitions and Acts of Parliament relating to metage attests the extent of the abuses. Measurement at the wharves was even less satisfactory than that in the Pool; for though the land-meters were required to give a certificate of quantity unloaded from the barges they were badly supervised, and a writer of 1815 declared that during the previous five years not one-third of the coal had been put into the bushel measure at all.²

Capacity as distinct from weight was a bad criterion of value. Small coals measured out a larger number of bushels from a chaldron than round (or great) coals, and it was therefore to the interest of the dealers to break them up. "If very dry, the coals being wetted, will burst out like clod lime", and so water was poured on them at the wharf.³ The system of metage was possibly of use in ensuring that cargoes did not escape altogether the pay-

¹ *Complaint and Address of the Under-Meters*, 15; and *Answer*, 6-10.

² T. Telltruth, *A Dark Story*, 12; see also *Report* (1800), App. 556.

³ Edington, *op. cit.* 191.

ment of duties; but it is doubtful if it ever served the interests of the consumer, and by 1800 it was clearly a nuisance. Nevertheless, it persisted for more than three decades of the nineteenth century; and not until 1831 did the practice of measuring coal, and with it the office of coal-meter, come to an end.

CHAPTER XIII

COMBINATIONS IN THE COAL TRADE

There is that scattereth, and yet increaseth; and there is that withholdeth more than is meet, but it tendeth to poverty. PROVERBS xi. 24.

(Written on the cover of Sir Richard Newdigate's *Coalpit Book for ye Great Rider*, 1700/1.)

THE co-existence of a single source of supply in the North with a concentrated market in the South held out temptations to producers on the one hand, and to dealers on the other, to combine to regulate quantities and prices in their own interests. As early as 1595 a rise in the price of coal in London was attributed to the concerted coal-owning hostmen.¹ In 1603 a Mayor of Newcastle, and six years later a Lord Mayor of London, protested against the control of supplies by the gild.² In 1665, when the Dutch War was interfering with marketing and stocks were accumulating in the North, a large number of hostmen coal-owners agreed to suspend production for five months. And for other years of the seventeenth century there is evidence that a tight hold was maintained on the trade.³

During the next hundred years, it is true, the power of the gild was weakening, and dealers who were not hostmen were engaging in the sale of coal. But it is now known that the "limitation of the vend", beginning in 1771, was by no means the first eighteenth-century attempt at regulation,⁴ and that selling agreements existed

¹ *Trans. Surtees Soc.* cv. 2.

² *Ibid.* xxiii.; and Taylor, *Archæology of the Coal Trade*, 178.

³ *Tracts on the Coal Trade* (Bell Coll.), i.; Surtees, *op. cit.* xxxv.; *Hist. of Newcastle* (Anon., 1801), 462.

⁴ As suggested by H. Levy, *Monopolies, Cartels, and Trusts* (2nd edit.), 107: "We know of no facts, apart from an attempt in 1768, which prove the existence of combinations in the years before 1771".

intermittently throughout the whole period. For 1711 there is the evidence of a restraining Act of Parliament; for 1727 the statement of a later writer concerning a compact of the Durham owners not to sell below 11s. 6d. a chaldron; and for 1738 a record of an agreement of hostmen-fitters in a secret minute book of the gild.¹ Petitions of 1741 and 1766 suggest combinations of the same body of men, and in 1765 there is definite proof of an agreement to regulate sales.²

Wars, variations of demand, and monopolistic practices at London all affected the trade, and it is not easy to exhibit the effects on prices of limitation of the vend. It is significant, however, that after the passing of an Act in 1730 the price of coal at Newcastle fell from 15s. to 9s. 6d.; that in 1739, after the expiration of this Act, it rose to 13s.; and that after another Act was passed in 1744, good-quality coal fell to 11s. a chaldron.³

Light on the methods of the combination is afforded by a pamphlet⁴ of 1739, which attributes the rise in price to the action of the "Grand Allies" and "to the Owners of a number of other Coal Mines from whence much more than half the usual vend might, and probably would be supplied, did not their Practices prevent". "They pay [adds the writer] annual Considerations for letting their Mines lye unwrought. They rent a great Number of Staithes or Coal Wharfs, of which they make no use at all, save that of debarring others from coming there. Besides all this, they have got into their Possession, by one means, or other, so large a share of all the Lands adjoining to the river Tine, that they have almost totally debarred all other Persons from Access to them, especially on the South side, where the

¹ 9 Anne, c. 28; Dunn, *op. cit.* 23; *Trans. Surtees Soc.* cv. 194 *et seq.*

² *Rept of Coal Comm.* (1871), iii. App. 3.

³ Philalethes, *loc. cit.*; 3 Geo. II. c. 26; *Enquiry into the Reason of the Advance in Coals*, 13; numerous petitions to Parliament, *J.H.C.* xxiii. 160-170, 263, 286, 303-18; *A Letter from a Master of a Collier*, i.; for the price of Friar's Goose coal in 1744 see *Bell Coll., Guard Book*, iii.

⁴ *Enquiry into the Advance.*

best coals are. And the like has been done with regard to the river Wear”.

The method adopted in 1738 and the following years was to assign to each fitter a portion of the agreed vend; any man who sold in excess was to cease operations until the others had made up their quotas; and each fitter was restricted to a single ship.¹

For the regulation beginning in 1771 it is possible to give more detail. It was the result of the opening of new mines near Newcastle and on the Wear. But it was also stimulated by the adoption of screening about the year 1766. This was first introduced at the collieries producing coal of inferior quality; for though it involved the waste of much small coal, it enabled the remainder to meet that of the richer mines on terms of equality in the market. The increased competition affected even the more favourably situated collieries, and perhaps reluctantly—“more out of apprehension than of conscience”²—they threw in their lot with the others and submitted to limitation of sale.

The total vend, based on that of the previous year, was divided between the collieries of the Tyne and those of the Wear roughly in the proportion of three to two—386,000 chaldrons to 254,000.³ As in the agreement of 1738, the vends were allotted monthly; but now collieries might exceed their quotas on payment of compensation to those which had produced, but had failed to vend, theirs. Since, however, the fines were smaller than the profits on sales no colliery had any incentive to keep its vend below the quantity assigned to it.⁴

The limitation of output was not very drastic, for during the period 1771–80 the average annual amount of coal sold exceeded that of the previous decade.⁵ But

¹ *Trans. Surtees Soc.* cv. 194-5.

² *The State of the Coal Trade.*

³ *Trans. N. of Eng. Min. Engrs.* xv. 211.

⁴ For details see Levy, *op. cit.* 114 *et seq.*, and *Report* (1800), 543, 641.

⁵ Especially on the Wear. The figures were 1761–70, 196,000; 1771–80, 250,000; 1781–86, 272,000 chaldrons.

when, in 1780, internal dissension brought the agreement to an end, a substantial increase took place in the volume of sales; and the price which had stood at 20s. 6d. a chaldron in 1781 had fallen by 1786 to 17s.¹ In the following year² another compact was made fixing the share of the Tyne at 450,000 and that of the Wear at 250,000 chaldrons, and the prices of best coals were settled in the two areas at 20s. and 18s. respectively.³ But again there took place a steady increase in exports, so that the standard prices were reached only very occasionally. Evidently competition was by no means strangled, and with the announcement of the appointment of a Committee of Enquiry in 1799, the agreement was allowed to lapse.

The *modus operandi* of the regulation of 1787-99 did not differ appreciably from that of its forerunners and successors.⁴ Notwithstanding the adverse comments of the Committee of 1800, the limitation was renewed, and continued with only temporary interruptions until 1858. And, once more, in spite of the compact, there occurred a steady increase in the quantities sold, though the competition of inland collieries now reduced the rate of increase. The Tyne exported 282,000 chaldrons more in 1828 than in 1801, and the Wear 242,000 more.

The arguments of the apologists of the vend were the now familiar ones that there was an excess of productive capacity, and that it was highly desirable in an industry where fixed costs were high to reduce the

¹ Dunn, *op. cit.* 69; Macnab, *Letter to William Pitt* (1793), 217.

² The *Report* of 1800 gives the date as either 1786 or 1787; the *Gateshead Observer*, December 9, 1843, gives it as 1787.

³ *The Prefatory Part of a Plan*, 12.

⁴ It was described by the Town Clerk of Newcastle in evidence before the Committee of 1800, App. 640. After showing that the vends were estimated a year ahead, he said: "They add to this quantity, a larger quantity, probably one-half, probably more; they then divide this aggregate quantity among all the Collieries upon the river . . . according to the powers of working and other circumstances. . . . The actual vend of the stated period when ascertained is distributed amongst the Collieries in like manner, each part of the actual vend bearing the same proportion to the actual vend as the allotted part bore to the original quantity taken as a basis to the vend".

range of market fluctuations.¹ Price statistics of the eighteenth century are far from satisfactory, and it is impossible to be sure that those quoted always refer to the same grade of coal. But, such as they are, they suggest that the fluctuations of prices at Newcastle were very much smaller than those at London.² And for this regulation was probably largely responsible. In carrying out their policy the northern coal-owners certainly brought about some elevation of the general level, for in years when there was an open trade prices fell.³ But it does not seem probable that the regulated prices were very much above those that would have existed under competitive conditions. It is true that the committee of 1800 reported that the increase in selling prices (compared with those of 1792) was far greater than that in the cost of labour and materials.⁴ But it can be shown that the advance in coal was hardly greater than that in Professor Silberling's index number of commodities in general; and that if we compare prices in 1786—the year before regulation was adopted—with those of 1800, the upward movement of Newcastle coal prices was somewhat less steep than that of other prices.⁵

The restriction of output cannot have been drastic, for a progressive increase of sales took place throughout the period.⁶ Each proprietor had an incentive to obtain a large allotment; and since the quota depended on the apparent productive capacity of each colliery, coal-owners frequently leased more land, sank more pits, and built more miners' houses than they would other-

¹ *Report* (1829), ev. 11; (1830), ev. 14, 88, 302.

² Appendix F.

³ This was clearly seen in 1821, 1824, 1826, and 1829. Dunn, *op. cit.* 25; *Report* (1829), 9.

⁴ *Ibid.* (1800), 640-41.

⁵ The prices of coal were: 1786, 17s.; 1793, 18s.; 1800, 26s. 6d. The corresponding indices of general commodities are 98, 109, and 159. For these see N. J. Silberling, *British Prices and Business Cycles, 1779-1850. The Review of Economic Statistics*, 1923.

⁶ While in 1800 there were 25 collieries on the Tyne and 9 on the Wear, by 1828 there were 41 on the Tyne and 18 on the Wear. *Report* (1829), 41.

wise have done. And there must have been some collieries that would have shut down under competition but were enabled by combination to survive and add to the total output. It seems unlikely, therefore, that the growth of the industry in Northumberland and Durham was seriously retarded by the limitation of the vend, or that the prices demanded by the northern coal-owners were ever so high as to be extortionate.

Apart from the consumers in London there was another class whose economic interests were perhaps adversely affected by the policy, or at least by the methods, of the northern coal-owners. Collieries frequently exhausted their monthly or yearly quotas some days or even weeks before the end of the period, and the fact that fines would have to be paid on any excess vending sometimes led them to cease loading until the opening of a new period. Vessels partially loaded were thus kept waiting in the river to the obvious loss of the shipowners.¹

It is clear, however, that the masters of the vessels were themselves often responsible for delays between voyages. In 1728 they set up an office in London where a register was kept to ensure that ships should unload in turn. On completion of unloading each shipmaster was given a certificate without which, by arrangement with the northern fitters, no new cargoes would be supplied. This system of rotation, it was urged by opponents, reduced the competition between masters in loading and unloading, and hence reduced the supply of coal at the market.² Protests against it are met with at various times from 1731 to 1830;³ but the shipowners declared that they were "under an unavoidable Necessity to imploy Agents and Factors to dispose of our Coals, and deliver our Ships in Order" in face of the practice of the lightermen buyers who demanded pre-

¹ *Trans. Surtees Soc.* cv. 195; *Report* (1800), ev. 550, 562.

² *Philalethes*, *op. cit.* 6-7; *J.H.C.* xxi. 369-72.

³ *J.H.C.* xxi. 739; xxiii. 145-66, 263-313; xxx. 542; xlii. 267-274, 746, 773, 788. *Report* (1830), 5-6.

miums for quick sales.¹ There was, indeed, much to be said for the arrangement. A complaint of some Whitby shipowners that they were compelled to wait eight or ten weeks for cargoes, led Parliament to sanction unloading by rotation in 1766. And the practice was again made compulsory in 1788 at the request of shipowners, who showed that some of the fitters with ships of their own were giving preference to these not only in the quality of the coal supplied, but also in speed of loading.² It was also said that London buyers were demanding premiums ranging from four to ten guineas a cargo, and, by their regulations restricting the amount of coals to be unloaded each day, were causing unnecessary delay.

Whether coal-owners, fitters, or lightermen buyers were most responsible for holding up the vessels it is difficult to say; but it is beyond question that the shipowners were not guiltless. Masters sometimes chose to wait in the river at Newcastle for long periods so as to obtain the best quality of coal; for the profits on this were larger than on other grades, and since the crew was paid by the voyage there was no expense on account of wages during the period of waiting.³

Practices of this kind do not, however, imply combination, and there is no reason to believe that the shipping trade was other than competitive. Economically the proprietors of ships were in a weak position, for they stood between the well-organised coal-owners and fitters on the one hand and the powerful body of London buyers on the other; and both fitters and buyers often had ships of their own, so that it was impossible for the shipowners to charge extortionate rates. There

¹ Petition of Shipowners to Parliament, 1729, cited Philaethes, *op. cit.* 13. See also a second petition of 1730, Broadsheet, *The Case of the Owners of Ships in the Coal Trade*.

² See also *J.H.C.* xxx. 452: "By which method . . . the Fitters whose Ships make so many more Voyages in a Year than the Petitioners', of Course, have immense Profits upon their Coals . . . and will in a Short Time be Masters of the whole Coal Trade".

³ *Report* (1800), App. 550, 562.

is no evidence that vast fortunes were made in the trade, and there are many complaints of poverty. In 1729 the shipowners declared that "this great Adventure, which cost upwards of twelve hundred thousand Pounds, is reduced not to be worth Five, and the Stock for carrying on the Trade almost lost, . . . above one hundred Masters in three Towns have been brought to Want in a few Years".¹ And although the language is the hyperbole appropriate to petitions to Parliament, the statement was perhaps not without some foundation, for in 1730 it was said that the profits of the trade had not been more than 1½ per cent for many years past.²

The loss of the American colonies was a blow to the shipowners; for whereas vessels had been supplied by the Americans at about £5 a ton, after 1776 no more were sent, and home-built vessels cost about double the figure.³ In 1787 the trade was said to be so unprofitable that many owners preferred to act simply as carriers at a rate of 10s. 6d. a chaldron; and a writer of 1789 declared that "the gains arising to the Ship-owners were never sufficient to enable them to insure the whole of their property".⁴ Nevertheless, in 1800 shipowners rarely acted as mere carriers, and "twenty cargoes to one" were sold in London on their behalf.⁵

From time to time the earnings of carrying and selling coal were supplemented by profits from other sources. The colliers were well-adapted to smuggling, and during the French wars they were used not only as transports by the Government, but in any trade which offered opportunities of high profit.⁶ At this time, indeed, the gains of the masters of ships were high, but it was the war and the state of the currency that produced the windfall. There were too many vessels

¹ Philalethes, *op. cit.* 13.

² *J.H.C.* xxi. 516.

³ A Well Wisher, *op. cit.* 11.

⁴ Stephenson, *op. cit.* 3.

⁵ *Report* (1800), App. 557.

⁶ *Gentleman's Mag.* (1799), 685. The association of colliers with French smugglers is proved by letters of 1729. *Treasury Papers*, vol. 271 (1729), 51, 62.

and too many separate owners to allow of concerted operations on freights or market prices, and whatever class of intermediary was the villain in the piece it was certainly not the shipowner.

In London there is evidence of combinations among coal-dealers from an early period. In 1642 an Act was passed to restrain the impositions of the woodmongers; eleven years later they were again accused of rigging the market; and in 1665 "the Bill against the coal-merchants is found, and three of them are to come to their tryal next term".¹ Their successors, the lightermen, were similarly accused of confederacy. A broad-sheet of 1703 declares that² "whereas Billingsgate ought to be a Free Market . . . it is plain the same is now Restricted by a small number of Lightermen . . . now the Sole Buyers, to whom all Consumers of Coals apply themselves, instead of the Masters of Coal Ships, and thereby take Opportunity, upon the first Arrival of the Fleet of Colliers, in great Bodies, to Engross very large Quantities of Coals at a Price fix'd; and immediately after, they, for the remaining small Quantity, do generally Advance the Price . . . whereby the Market very often in two or three days' time, advances Two Shillings or Three Shillings per Chaldron by the said Engrossment".

So compact a body were the lightermen, indeed, that in 1729 ten of them were said to handle two-thirds of the whole supplies. They held monthly, weekly, and daily meetings to regulate their trade; they boycotted those master-mariners who were bold enough to deal with buyers not free of the Watermen's and Lightermen's Company; and, by refusing to clear vessels the owners of which would not agree to their terms, they were in a position to determine prices. The Committee of 1729 held that they were primarily responsible for the in-

¹ *The Rate of Charge, etc.*, Bell Coll. vii. 51; *The Two Grand Ingrossers of Coals*, cited *Penny Magazine*, April 30, 1835; *Hist. MSS. Comm.*, Heathcote MSS. 191.

² *The Case of the Watermen and Lightermen.*

crease from 23s. to 28s. a chaldron which had taken place during the preceding seven years.¹

In spite of an Act forbidding them to take commissions from coal-owners, passed in the reign of Anne,² there is reason to believe that the practice continued, and that lightermen frequently acted as factors. In 1731 an attempt was made to "regulate the trade" by an Act which sought to create competition between the lightermen and bargemen, attached further penalties to association of lightermen with coal-owners, and required both buyers and sellers to record each transaction in a book set aside for the purpose.³

Fresh complaints arose, however, in 1739 and 1740. In the following year there was talk of giving the Lord Mayor the power to fix the price of coal, and three years later an Act was passed providing that this should be determined by three justices.⁴

The arguments of pamphleteers of 1739 and 1743 indicate that the lightermen buyers were still regarded as the chief malefactors.⁵ How long they were able to maintain a close hold on the trade is uncertain; but the erection of a covered coal-exchange in 1769 must have narrowed the field of competition, and frequent complaints of monopolistic control by buyers were made in the later years of the century. In 1785 the Lord Mayor sent an ultimatum to the "crimps and buyers" threatening that unless they immediately delivered the cargoes from the colliers he would direct prosecutions against the "combinators"—with the result that 130 out of the 220 vessels in the river were quickly unloaded.⁶ In 1787 it was said that the buyers had so concentrated market dealings as to be able to exact large premiums and rebates from the northern coal-owners; and shortly

¹ *J.H.C.* xxi. 366-73; Philalethes, *op. cit.*; Aaron Hill, *On a Method of Furnishing Coals at a Third Part of the Price* (1718), 19 (*Bell Coll.*).

² 9 Anne, c. 28.

³ 3 Geo. II., c. 26.

⁴ *Hist. MSS. Comm.*, *Trevel MSS.* 28; *J.H.C.* xxiii. 493. *Gentleman's Mag.* (1740), 91.

⁵ *Enquiry into the Reasons, etc., and Frauds and Abuses, etc.*

⁶ Newspaper cutting in *Bell Coll.*

afterwards it was enacted that any covenant or partnership consisting of more than five persons for the purchase or sale of coal, or for regulating the manner of carrying on the trade was to be regarded as an unlawful combination in restraint of trade.¹ But that concerted action continued is evident: ships were delayed unless "dispatch money" was paid, and the buyers refused to deliver more than 42 chaldrons daily from any ship. They were accused of mixing coals—small coals were cheaper and the mixture measured out more profitably; of not maintaining an adequate number of lighters; of buying more cargoes at once than their lighters could unload, so that vessels were delayed in the Pool; and of evading measurement by collecting portions of the lighters' cargo from different ships.² Moreover, there is evidence that the coal-buyers took steps to limit entries to their calling, not only by the regulations governing admission to the Coal Exchange,³ but also by engrossing the wharves so that it was difficult for new coal-merchants to set up in business.⁴ But the ring was not so small as that of other sections of the trade, nor can it have been entirely closed; for in 1800 there were 75 buyers on the market, and in 1803 the number had apparently increased by ten.⁵

Suggestions were made from time to time that the factors, no less than the merchants, were responsible for forcing up prices. In 1743 one John Gibson carried on nearly one-fifth of the whole business, and a witness told the Committee of 1800 that "there being no more than about 12 or 14 Factors, who sell all the coals, they have it in their power to agree together to demand what they please". The figures were perhaps an understatement, for the number of factors in 1803

¹ 28 Geo. III., c. 53; *J.H.C.* xliii. 161.

² *Report* (1800), 551, 556, 560-61.

³ In 1800 a subscription of £3:18s. gained admission to the Room, but buyers would not take shares in a cargo with new-comers. *Report* (1800), 555, cv. George Easterby.

⁴ L. Knowles, *Industrial and Commercial Revolutions*, 99.

⁵ *Report* (1800), 641; Edington, *Essay* (1803), 46.

was put at 27, and in 1813 at 30. Paid as they were on a commission basis, they had probably nothing to gain by restricting sales; but some of them who had interests in shipping must naturally have looked with favour on rising prices; and it was argued that the Act of 1788 forbidding the combination of buyers had been injurious, since it had weakened the resistance of the buyers to the exorbitant demands of the factors. On the whole, however, they escape lightly at the hands of the 1800 Committee, and Edington gives them a good character. The chief count against them was that they refused to sell outside the regular channels of the trade, and so helped to maintain the privileged position of the buyers on the Exchange.¹

Of frauds and malpractices among other classes of intermediary many instances could be given. The smaller dealers were often guilty of short measure and of selling mixed coals as coals of best quality. A sack-maker of 1748 was convicted of making his bags six inches shorter than the regulation size; and another man acquired so great a reputation for this practice that he was openly known as the "pudding-sack man".² Meters accepted bribes to make out fictitious tickets, and there was much neglect of duty, especially by the land-meters, who were less well supervised than those on the colliers. But for none of these groups is there evidence of any *concerted* action hostile to the consumer.

To the ordinary man of the eighteenth century the "spread" between the price received by the northern producer and that paid by the London consumer seemed unduly great, and from time to time both official and private inquiries were made into it. Most of these attempted to fix the blame on one or other group of producers or traders; and it is doubtful if sufficient

¹ *H. of C. Accounts and Papers* (1749-77), 2, 59; *Report* (1800), App. 560-561, *ev.* Thomas Hawkes and James Dixon; Edington, *Treatise*, 83-4.

² *Gentleman's Mag.* (1748), 282; *The Frauds and Abuses*, 20.

attention was given to causes outside the control of the men in the industry, other than those operating through the duties levied at Newcastle and the far higher duties and charges imposed at the London end of the trade.

Of the impersonal causes of intermittent high prices not the least important was the weather. A persistent north-east wind might hold up the ships in the Tyne and Wear for weeks on end. A storm in the North Sea might cause the colliers to put into other ports for shelter, and perhaps unload their cargoes there. And a severe frost, such as occurred in 1709, 1715, 1739, 1763, 1767, 1777-78, and 1788-89, might freeze up the Thames and so cut off supplies at a time of most intense demand.¹

Again, the effect of war on prices is perhaps more clearly realised to-day than it was in the eighteenth century. Its special impact on the coal trade in the commandeering of vessels, the pressing of seamen, and the imposition of an expensive system of convoys was, it is true, patent to all. What was not so clear was that the rise in the price of coal was in the main simply part of a general upward movement of prices caused by the methods adopted to finance the wars. The chief increases of which complaints were made took place at such periods. Between 1702 and 1704 coal rose in price from 18s. to 40s.; in 1739-40 it jumped from 28s. to 36s. At the end of the Seven Years' War, in 1763, it had reached 55s., and during the American War, in 1781, it was 44s. After the outbreak of hostilities with France in 1793 the rise was continuous—from 30s. 9d. when war was declared to 60s. or 70s. in 1800, and 75s. in 1814. In view of the effects of inflation on all prices it was surely futile for the Committee of 1800 to spend so much time and ink on the habits of coal-masters and dealers.

¹ Wolford, *Old and New London*, iii. 314, *et seq.*; *Hist. MSS. Comm.*, *Hare MSS.* ix. 254; *J.H.C.* xxviii. 1047.

If, however, war and weather apart, the price of coal in London was higher than it ought to have been, the responsibility must have lain partly with the northern producers and partly with the London buyers. Of the two the coal-masters were the more cohesive group, and possessed the more effective instrument for controlling prices; but, as already remarked, the figures of sales suggest that they allowed the output to march more or less in step with the advance of demand. Moreover—and this must be stressed—the greater part of the final price of coal was made up of elements added after it had passed from the hands of the producer. In 1729 the Newcastle price on board ship was 6s. a chaldron; but freight and duties added 15s. 8d., and the charges of factors and dealers another 6s. 8d. The average price at the northern ports in 1800 was about 10s. a ton, and the selling price in London 43s. and 50s. a ton.¹ A generation later John Buddle showed² that transport charges were much heavier for similar services at London than at Newcastle. Unloading at London cost 1s. 7d., but loading in the North only 8½d.; the charge for lightering was 2s., but that for carriage by keel (over a greater distance) only 1s. 8d.; and cartage came to 3s. 8½d. per ton-mile in London, against 7d. or 10d. about the Tyne. Total loading charges at Newcastle amounted to 5s. 0¼d., and those of unloading and delivery at London to 14s. 6d.

It seems not unlikely that the disparity between prices in the North and those in the South was due largely to defects in the marketing arrangements at the London end of the trade. High duties were a serious barrier;³ the incredibly cumbrous system of metage hampered operations in the Pool and at the wharves. But it is probable that the regulations of the London buyers, which forced the trade to pass through a single constricted channel, were no less burdensome to the

¹ Philalethes, *op. cit.* 5; Dunn, *op. cit.* 27-8.

² *Report* (1829), ev. 12, 121, 310.

³ Appendix D.

consumer. The remedy for the evils lay not in any increase of state or municipal supervision, but in the abolition of duties, the substitution of weight for measure, and above all in those developments of transport which were to open up the London market to the abundant supplies of the inland coalfields.

CHAPTER XIV

OVERSEAS AND INLAND TRADE

By thy traffic hast thou increased thy riches.—EZEKIEL xxviii. 5.

THE shipments of coal to places outside Great Britain and Ireland can never have been significant in the eighteenth century. Such statistics as are available do not often distinguish between the exports to Ireland and those to foreign countries, and we can only guess that the latter were very small. Even in the eighteenth century "foreign trade had not yet completely lost its primitive characteristic—the exchange of precious things";¹ and freights on a heavy cargo like coal, dislocations due to wars, and substantial export duties, must all have restricted its volume. At times, it is true, the burden of the export taxes was somewhat lighter than that of the duties on imports at London and other ports, so that a bonus was offered to the foreign trade. A pamphleteer of 1739 "wondered that the Duty of Coal exported to foreign parts should be so much lower than for our home consumption", and in the same year Horace Walpole remarked that "because the coals upon exportation pay but a small duty compared with what is paid here, the Dutch buy them cheaper than the manufacturer has them here".²

Again, certain classes of British coal were peculiarly suited to the fuel requirements of foreign manufacturers and household consumers. The great lumps of splint coal which were the typical product of the mines about the Forth were in special demand in the Low

¹ Clapham, *op. cit.* 237.

² *Enquiry into the Advance in the Price of Coals* (1739), 37; *Hist. MSS. Comm., Report*, App. ix. 28.

Countries: "I found no place where great Scots coalls were more in request than in the country of Flanders", said a writer¹ of 1683. "The wood which they were wont to burne formerly being much destroyed by the late warrs causeth the great coalls sell well with the brewers, salters, soap boylers, and most all trades except the smiths in Ghent, Bridges, Ostende, Neuport, Dixmuyde, Epre, etc., the price being the only impediment". The smiths, of course, wanted small coals for coking, and after the adoption of screening in Northumberland and Durham in 1766 a moderate trade in these arose from the demand of the smiths and founders of Portugal.² The tidy housewives of Holland, on the other hand, liked the splint coals of the east of Scotland, because they could split them into pieces like slates, sweep them clean, and lay them ready for the fire.³ In 1789, 132,500 tons of British coal were disposed of in Holland—exactly half the estimated sale abroad. Next came France and Flanders, with 53,000 tons, and smaller quantities were sent to Denmark, Hamburg, Sweden, Russia, and Portugal.⁴

The trade to Ireland was on a much larger scale. The chief source of supply was the Cumberland coalfield; but some coal also reached Belfast, Dublin, and Cork from Northumberland and Durham, from the west of Scotland, from the Wigan coalfield *via* Liverpool, and from both North and South Wales. In this trade the coalfields of the West had not only a geographical advantage over the Great Northern Coalfield, but also the stimulus of lowered export duties. Early in the century the tax from these sources of supply was fixed at 1s. per chaldron (by 9 Anne, c. 6), and even in 1788 it was only 2s. From time to time, it is true, the Irish attempted to foster their own coal industry; in

¹ *Hist. MSS. Comm., MSS of the Earl of Mar and Kellie*, 212-13.

² Edington, *Treatise*, 101.

³ Bald, *op. cit.* 84. The colliers often brought back timber from Norway. *Acts of the Parliaments of Scotland*, x. App. 121.

⁴ Beaumont, cited by Dunn, *op. cit.* 26.

1757 a bonus of 2s. was given on every ton of Irish coal sent to Dublin, and in 1782 a protective import duty of 1s. a ton was imposed.¹ But the Irish coal-mines were badly managed and were too remote from Dublin to allow of extensive sales in face of the competition of the British coal-masters. In 1729 the exports to Ireland from Scotland, Wales, and the west of England were estimated at 60,000 or 70,000 tons; in 1764-70 the annual imports to Ireland were 180,000 tons; in 1771-78, 205,000 tons; and thirty years later 670,000 tons.² Perhaps twice as much coal was sent to Ireland in a normal year as to all other countries outside Great Britain. But Irish and foreign trade combined can never have exceeded a small fraction—perhaps one-third—of the trade with English and Scottish ports.

By far the largest of British coalfields was almost entirely dependent on coastwise shipments: in 1752 nearly five-sixths, and in 1798 nearly four-fifths of the output of Northumberland and Durham was sent away by sea, and almost the whole of this went to London and other English ports. The market extended from Whitby on the east coast to Falmouth on the south, and occasionally Newcastle coal was carried to places on the western coast of Cornwall, Devon, and Somerset. Cornwall, indeed, became an important market, especially after 1741, when a rebate of duties was allowed on coal sent for use at the tin and copper mines.³ Newcastle coal also sold along the east coast of Scotland, for the existence of heavier export duties on Scottish coals, and the vexatious practice of Scottish customs officers in requiring all cargoes to be remeasured at the Customs House, favoured the English coal-masters. After 1763, when the English duty was removed from exports to places north of the Forth, the sale increased; and, in spite of the growth of the Scottish industry, in the early years of the nineteenth century the ports north of the

¹ H. G. Graves in *Trans. Inst. Min. Engrs.* xiv. 182-3.

² *Ibid.* and *Report* (1871), iii. 27, 48.

³ 14 Geo. II. c. 41.

Firth of Tay were still supplied mainly from the Tyne and Wear.¹

From Whitehaven and other shipping points in Cumberland coal was carried coastwise to the importing centres of the west of England and Wales as far as Carnarvon. From the coalfields of Flint and Denbigh it was shipped to places on the coast of North Wales and to the copper-mines of Parys Mountain in Anglesey; and coal from South Wales and Monmouth was sent to ports of the Bristol Channel, and sometimes, in small quantities, to London.

Sea-borne coal was supplied by way of London to all the centres of population in the Thames valley and the home counties. From the outports it was transported over a belt of country the extent of which depended on the navigability of the rivers. Along highways like the Severn or the Ouse it might be carried a considerable distance, but towns even a few miles from the coast might go short of fuel if there were no waterway. Kendal was only a short distance from Morecambe Bay, where Whitehaven coals could be obtained cheaply, but the town had to make shift with turf cut from the neighbouring mosses. In 1729, so acute was the dearth of fuel that the place was losing, so it was alleged, its extensive trades of weaving and tanning. A petition was made for the remission of the duty on water-borne coal so as to make it possible to bear the costs of transferring it to Kendal; but the reflection that other inland towns would demand similar indulgence if the request were granted led the Commissioners of the Treasury to refuse. Possibly, too, the names of the signatories—Gilfred Lawson, James Lowther, and Daniel Wilson—may well have set them wondering whether solicitude for the poor consumer was the only motive behind the petition.²

¹ Bald, *op. cit.* 104. *A Memorial in Regard to the Coal of Scotland* asserts that the duties on exports from Scotland were four or five times as heavy as those on exports from the Tyne. See also Macnab, *Third Letter to William Pitt* (1793).

² *Treasury Papers*, vol. 271 (1729), 31 and 31A.

The organisation of the trade at the outports was very much simpler than that of the metropolis. Duties were generally much lower; the colliers were unloaded by the sailors; and there was no specialised body of lightermen and heavers. The single bushel measure was used instead of the vat, and at many places sale by weight took the place of sale by measure. The problems of marketing were, therefore, never so serious as to give rise to public inquiries such as those from which so much of our knowledge of the London trade is derived.

"Inland coal" was generally inferior to "sea coal". Even in Northumberland and Durham the "land-sale" coal sent to the salt-pans of Shields and to the iron-works of Winlaton was of secondary grade, and the same was true of that supplied by the mines of Cumberland to the furnaces at Seaton. In Scotland the best kinds of coal were reserved for the use of the domestic consumers of Edinburgh and Glasgow, and the smaller and inferior coal was used in lime-burning, distilling, and the evaporation of brine. All these outlets were small, however, compared with that afforded by the voracious foundries which were built up on the model of the Carron Ironworks after 1760, the demand of which was so great as sometimes to arouse fears for the supply of coals to householders.

For the purely inland coalfields the bounds of the market in the early years of the century were very narrow, for roads were too bad to allow of much carriage by waggon. Coal from the pits of Staffordshire was moved in baskets or boxes (each holding a couple of hundredweight) slung on the backs of horses; and before 1767 coal from the mines about Merthyr was taken by ponies and donkeys over mountain paths into Herefordshire and other neighbouring counties. Farmers who used to buy coal of John Guest at Dowlais for $\frac{1}{2}$ d. a sack exacted a price of 10d. a sack at Brecon and Kington; and, though the collieries were only a

few miles from the town, the expense of carriage by pack-horse doubled the cost of coal before it reached Manchester.¹

Transport by river was much cheaper, though traffic was often hampered not only by the existence of locks, weirs, and water-wheels, but also by floods, drought, tidal action, or the silting of the river-bed owing to the practice of the watermen in throwing ballast overboard at shallow parts of the stream. Plans for widening and deepening rivers were undertaken largely in order to facilitate the movement of fuel; but notwithstanding the improvements in the Stour (1691), the Aire and Calder (1699 and 1744), the Mersey and Irwell, the Weaver and the Douglas (1720), the Don (1726-27 and 1739) and the Dee (1734, 1740, and 1753), little traffic was carried over long distance by river, except on the Severn and the Thames.

Of coal raised in the inland counties that of Shropshire went farthest afield. Large quantities of the soft "clod" coal were consumed at the furnaces about Coalbrookdale; but as early as 1752 it was estimated that a hundred thousand tons were shipped annually on the Severn from the collieries at Madeley and Broseley alone.² Clod coal was also taken by the salt-works at Droitwich, which had been made accessible by the improvement of the river Salwarpe,³ and the best coal was sent for domestic use to Shrewsbury, Bridgnorth, Ludlow, Hereford, Worcester, Tewkesbury, Gloucester, and Bristol.⁴

The relatively small output of the Forest of Dean was absorbed locally by lime-burners and smiths, though small quantities for household consumption were sent to Monmouth, Lydbrook, and the lower

¹ Lawley, *History of Bilston*, 252; J. L. and B. Hammond, *Rise of Modern Industry*, 70; E. Phillips in *Western Mail*, December 9, 1924; Jackman, *Transportation in Modern England*, i. 359.

² This was probably no over-statement, for the estimated output of Shropshire in 1756 was 250,000-300,000 tons. *Report* (1871), iii. 19.

³ *Hist. MSS. Comm.*, 13th Report, App. vi. 386.

⁴ Rudder, *History of Gloucestershire* (1779), 26; *V.C.H. Shropshire*, i. 454.

parts of Gloucestershire, and some even as far as Droitwich. The coal of Kingswood naturally found its market in Bristol, and that of the Radstock area went into Wiltshire, Dorset, and North Devon, till it came into competition with the sea-borne supplies landed at ports on the south coast. Some coals from Glamorgan, as already mentioned, were carried into Brecknock and Hereford, but those from the pits of the Mackworths in the Beaufort area were principally used locally in copper-smelting, and those of the Merthyr collieries in the ironworks which came into being after the middle of the century.¹

The coal of North Staffordshire was consumed chiefly at the pot-banks in the immediate vicinity, but considerable quantities were supplied to the salt-pans of the Cheshire "wiches"; and that of South Staffordshire was used in the miscellaneous iron-working trades of Birmingham and the Black Country, though some, it was said, was carried by pack-horse as far north as Macclesfield. If the sales of Griff Colliery can be taken as typical, the output of the Warwickshire field was used for domestic purposes in Coventry and parts of Leicestershire and Nottinghamshire. From Ashby-de-la-Zouch supplies were sent down the Trent to Burton, Newark, Grantham, Gainsborough, Lincoln, and even to Bawtry and Hull. The town of Nottingham obtained its fuel from the pits at Wollaton, and Derby was served by those about Heanor and Smalley. In the summer coal from this area found its way south as far as Northamptonshire, whence barley was brought in return; but most of the output was absorbed in the local industries of malting, soap-boiling, lime-burning, and, later, of iron-founding. Similarly the collieries about Chesterfield supplied the local smiths and nail-workers, but some coal was carried west to meet the needs of the lead-smelters about the Peak.²

¹ H. G. Nicholls, *Forest of Dean*, 46, 70, 234; Heath, *Account of Monmouth* (1804); *V.C.H. Worcester*, ii. 265; *V.C.H. Somerset*, ii. 385.

² *V.C.H. Worcester*, ii. 265; Dud Dudley, *Metallum Martis*; and Lawley *History of Bilston*, 252; *V.C.H. Nottingham*, 327, 329, 352; *V.C.H. Derby*, 355.

In Yorkshire the coal worked about Sheffield and Barnsley was used in the local iron and cutlery trades, and there is no evidence that it was taken far afield. That raised from the pits about Wakefield and Leeds, however, was transported on the Aire and Calder as far as York and Hull. But the northern dales of Yorkshire received their supplies more easily from the collieries of the Tees. Lancashire coal was consumed almost entirely in the county itself. The needs of the growing population of the south-east were met by the Duke of Bridgewater and other coal-owning landlords, and Wigan coal was used by the file-makers, glass-blowers, and other artisans of the district between Warrington and Liverpool. Some was carried by the Douglas and the Ribble to the agricultural areas, and there was a small but regular export to North Wales and Ireland.¹

The gaps in this somewhat tedious catalogue indicate that before the opening of the canal era there were considerable areas of Britain in which the use of mineral fuel was unknown. In most of the southern counties the poor had to gather brushwood for their fires, and where this was scarce, like the Indian peasant of to-day, they made use of a mixture of dung and straw. In the hilly parts of the northern counties peat was cut from the Pennines; and in Somerset turf from the Quantocks was supplemented by bark which had fulfilled its primary functions in the local tan-yards.²

Even in the neighbourhood of the coal-pits fuel was sometimes dear, for the absence of transport facilities often gave the producer the power to exploit the consumer; and, on occasion, violent measures were taken to obtain or preserve such power. In 1739 complaints were made at Derby that "many evil-disposed Persons . . . have of late entered into Combinations, wilfully and maliciously to destroy Coal Works and Collieries . . .

¹ Baines, *Yorkshire Past and Present*, iii. 615; *V.C.H. Yorks*, ii. 340; T. Whitehouse, *History of Wigan* (in MS.), 25, 27.

² *V.C.H. Somerset*, ii. 384-5; Macnab, *Third Letter*, 105n.

and have accordingly destroyed and drowned some Coal Works . . . with intent to extravagantly enhance the Price of Coals, and procure to themselves a Monopoly".¹ In 1774 rioting occurred in Sheffield owing to the high prices charged for coal by the lessees of the Duke of Norfolk.² In 1778 there were protests from Leeds against the insufficiency of the supply and the excessive price demanded by Charles Brandling.³ And even in Newcastle the consumer had sometimes to complain of high prices and inferior quality, especially at seasons of brisk demand in the London market.⁴ The lack of a uniform system of measures often facilitated the exploitation of the purchaser. John Watson found that a nominal 20-peck corf at Long Benton was deficient by no less than 467 cubic inches.⁵ Fault was found with the weights used by Sir Herbert Mackworth at Neath in 1767.⁶ And the men who transported the coal from the Forest of Dean were in the habit of loading their horses with as much as they could carry in the Forest, "but when they arrive at Wye-bridge, or some other convenient spot out of the public eye they take the bag off the horses' backs, and . . . distribute their burdens, making what was contained in three fill four or five bags".⁷

The transport revolution associated with the names of Metcalfe, Telford, and Macadam wrought profound changes. Not only were the roads improved in surface, width, and foundation, and so made fit to bear the heavy coal carts, but they were so shortened and linked up with one another as to produce important results on the cost of carriage. "The poor manufacturer is now

¹ *J.H.C.* xxiii. 429.

² *Annual Register* (1774), November 29.

³ Baines, *op. cit.* 160.

⁴ In 1826, "when Sir Thomas (Burdon) had a Sea Sale for Coals, instead of giving the Town Carts their fair Lot, they were kept waiting until they could be supplied with Rusty and Inferior Coals unfit for Sea Sale". *The Cartmen's Reply to the Calumnies of Sir Thomas Burdon* (1826), Newcastle Pamphlets.

⁵ *John Watson's Journal*.

⁶ Phillips, *op. cit.* 237.

⁷ Heath, *Accounts of Monmouth* (1804), art. Coals.

under a Necessity of paying Ten Pence, Eleven Pence and Twelve Pence per Hundred Weight for his Coals in the Winter Season", said a writer in 1764. But if a projected road were made from Nottingham "the Price . . . would . . . be reduced to Six Pence per Hundred Weight, even in the Depths of Winter".¹ The special waggon-ways which had long existed from the pits to the staithes on the Tyne, to the coast at Whitehaven, and to the Severn at Coalbrookdale, were imitated in the other coalfields. The construction of such a road at Leeds in 1758 was made conditional on a reduction in the price of coal from the Brandling's colliery. In 1774 the Duke of Norfolk made a waggon-way from his pits to Sheffield, which reduced the cost of carriage from 2s. 8d. to 1s. 2d. a ton. And in 1802 the first of a number of tramways which were to transform the coal industry of South Wales was made from Newport up the Sirhowy Valley.²

More important still was the construction of a system of canals. Between 1758 and 1801 no fewer than 165 Acts were passed for the purpose, and of these 90 had as their prime object the carriage of coal.³ Under the Bridgewater Canal Acts of 1759 and 1760 the Duke was to deliver coal at Salford for not more than 4d. per cwt. instead of the 5d. or 7d. previously charged. Carriage by canal between Chesterfield and the Trent cost only one-fifth of that by road; and the Grand Trunk lowered freights in general to a third or a quarter of those demanded for road transport. The opening of the Erewash and Nottingham Canals led, it is true, in the first instance, to an increase in the local cost of coal, owing to the growth of a demand from regions which had previously been forced to go without; but, even here, the long-period result was a substantial fall in price.⁴

¹ *Case relating to an Intended Road from Nottingham* (1764).

² *Leeds Intelligencer*, January 17, 1758; Sorby in *Trans. Inst. Min. Engrs.* lxx. 91.

³ Pratt, *History of Inland Waterways*, 183-4.

⁴ Jackman, *loc. cit.*; *V.C.H. Nottingham*, 329.

Apart from their effect in giving cheaper coal throughout the country, the canals reduced very considerably the differential advantages enjoyed by industrial concerns established near the centres of supply, and enabled those more remote to compete on better terms. This equalising effect may be illustrated from an Account Book of the Duke of Bridgewater. In 1778 the price of coal at the pits at Worsley was 4s. 2d. a ton; at Longford and Barton Bridge a few miles along the canal its price was 5s. 10d.; at Sale Moor and at Broadheath, a little farther still, it was 6s. 8d.; but many miles on at Stockton and Preston it was still only 6s. 8d.¹ The practice of setting a maximum to the cost of carriage whatever the distance covered was also followed on the Grand Trunk Canal. It is safe to assume that it was never adopted by the carriers on the roads.

Since no duties were levied on inland coals, the new areas supplied by the canals obtained their fuel at a much lower price than did London and other places supplied by sea. In 1794 sea-borne coal in Carnarvonshire cost 28s. a ton; in 1799 at Bury St. Edmunds it cost 26s.; and in 1800 London prices ranged from 43s. to 50s. a ton.² But in 1790 land-sale coal was selling at the pit head in South Staffordshire for 4s. 6d. a ton; in 1793 at Derby for 5s. 10d.; in 1799 at Sheffield for 7s. a ton; in 1800 at Barnsley for as little as 2s. 6d.; and in the same year in Shropshire for 4s. 6d. a ton.³ Direct comparison is invalidated by reason of the higher quality of the sea-borne coal as well as by slight variations in local weights and measures.⁴ Moreover,

¹ *Account Book of Robert Lansdale, 1778, Bridgewater MSS.*

² *Report* (1871), iii. 23; *Annual Register* (1801), 14; Dunn, *op. cit.* 27-8.

³ Lawley, *op. cit.* 250; *V.C.H. Derby*, ii. 355; *Norfolk MSS.*; Hoyle, *History of Barnsley*, 102; *Report* (1800), App. 564, 566.

⁴ Inland coal was generally, though not invariably, sold by weight. In Staffordshire, the Forest of Dean, and Leicestershire the ton contained 21 cwts. of 112 lbs., but in Lancashire and Yorkshire it contained 20 cwts. of 112 lbs., though at Leeds coal was generally sold by the corf and at Sheffield by the stone. In South Wales the practice was to deal in terms of bushels and weys; in Cumberland the ten measure was used for large consignments; and in Northumberland and Durham coal was sold by bolls, fothers, cart-loads, and

the charges for carriage by road or canal would have to be added to these pit-head prices before arriving at the cost to the consumer. Nevertheless, it can hardly be doubted that inland coals were generally cheaper than those brought by sea, and the difference must have been of some moment in determining the localisation of industry before the removal of the import duties in 1831.

The geographical extension of the markets of the inland coalfields is exhibited in the evidence presented to the Committee on the Coal Trade in 1830. Supplies from the Forest of Dean were now carried down the Kennet and Avon canal as far as Reading, where they came into competition not only with the sea-coals of Newcastle carried up the Thames, but also with those of South Staffordshire brought by way of the Oxford Canal. Coal from South Staffordshire had also obtained access to the Severn and to the area south of Burton-on-Trent. And that from Warwickshire and Leicestershire was selling in Oxford. The coal-masters of South Wales now served the whole of Cornwall and North Devon as far as Chard and Yeovil; and the North Wales coalfield supplied Macclesfield, Newcastle-under-Lyme, and Shrewsbury. The construction of the Leeds and Liverpool Canal greatly extended the sales of Wigan coals in Ireland,¹ and supplies from this field also sold as far away as Askrigg in the North Riding, where they met with competition from both Cumberland and Durham. The markets of the coalfields of Yorkshire, Derby, and Nottingham now covered an area from Knaresbrough and Pickering in the north almost to Northampton in the south; and places as far apart as Huddersfield and Peterborough came within their

waggon-loads. In Scotland the measures about Edinburgh and Glasgow were the load, meth, cart, Dutch-stone, and hundredweight; about the Firth of Forth a chaldron, weighing 30 cwts.; and at Perth a chaldron of 5 cwts.

¹ The *Haigh MSS.* indicate that Lord Balcarras, formerly Sir Roger Bradshaigh, was making much use of the canal in 1788.

sphere. Alone of the inland coalfields those of Shropshire and North Staffordshire showed but relatively small extensions of the territories served, for the growth of the iron and pottery trades was such as to absorb the greater part of their increasing output.¹

This widening of markets did not take place without much opposition. The industrialists of the Midlands feared that it might trench on their own sources of fuel; and the coal-owners of the North were the constant antagonists of the projectors of new canals. Their alarm was hardly justified. The new-born competition was confined mainly to places on the western and, to a slight extent, on the southern coasts. Northumberland and Durham still held the field in all those areas which could be reached from the ports of the East and South-East; and the whole of the country below a line from the Wash to the Thames at Windsor and thence to Plymouth was still in their possession. In London itself the monopoly of the coal-masters of Northumberland and Durham was almost unimpaired: only 2580 tons of inland coal reached the metropolis in 1805, and as late as 1831 only 10,742 tons. Sea-coal from other fields was, it is true, a more formidable rival; but of total imports approximating two million tons not more than 125,000 tons was brought from collieries outside Northumberland and Durham in 1826.²

For this the restrictive canal legislation of the seven-teen-nineties was partly responsible. No coal might be brought by the Grand Junction Canal beyond Grove Park (Herts), or by the Wiltshire and Berkshire Canal beyond Reading. The tolls on the upper reaches of the Thames were excessive, and after 1805 inland coal carried to London was required to pay a duty of about

¹ *Report* (1830), ev. of F. Page, 291. See also Clapham, *op. cit.* 236, and the map reproduced from the *Report*.

² For the opposition to the carriage of coal by canal see *J.H.C.* xxxii. 289; Walpole's *George III.* iv. 98; the *Letters of Dr. Macnab, passim*; Jackman, *op. cit.* 374; and *Report* (1829), 95. For statistics of imports to London, see *Report* (1871), iii. 14-26, 61-2.

10s. a chaldron. An obstruction hardly less serious was presented by the vested interests of the London factors and buyers, whose powerful influence was exerted in favour of sea-borne supplies. As the centre of gravity of production moved away from Northumberland and Durham the consumers of metropolitan England, no less than the coal-owners of Lancashire, Yorkshire, and the Midlands, had a real grievance. It was not until well into the railway era that the secretive alleys of eighteenth-century marketing were replaced by thoroughfares less inadequate to the needs of a great community and a great industry.

APPENDIX A

"LEADINGS from the severall Pitts at Long Benton Colliery from the time of that Colliery's first working." ¹

The Year.	First Pitt.	Second.	Third.	Lane Pitt.	Meadow.	Total.
	Tens. W.					
1744	84 3	...	...	...	...	84 3
1745	498 21	779 10	...	...	...	1277 9
1746	186 2	681 9	517 12	...	...	1385 1
1747	...	26 8	869 1	469 13	...	1365
1748	...	...	411	986 4	...	1397 4
1749	...	...	...	867 1	484 15	1351 16
Nov. 28, } 1750 }	...	...	...	820 15	961 9	1782 2
	769 4	1486 5	1797 13	3143 11	1446 2	8642 13

¹ *Watson Coll.: Killingworth and Long Benton Reports (1734-1813), vol. i.*
At this period the Ten consisted of 22 waggon-loads.

APPENDIX B

BOND OF CHARLAW COLLIERY, 1767¹

ARTICLES of Agreement had made and fully agreed upon this Twenty third day of November for the year of our Lord one Thousand, Seven Hundred and sixty seven Between John Smith of Wilton Gilbert in the County of Durham of the one part and the several and respective workmen. In consideration of one Shilling Lawfull money to them in hand paid for their binding money the Receipt whereof they do hereby severally acknowledge and confess. Also in further Consideration of the Rates and prices to be paid them by the said John Smith his Heirs or Assigns, Do hereby Bind themselves separately to be his servants as Hewers and Barrowmen In and at Charlaw Colliery In the Parish of Wilton Gilbert and County of Durham aforesaid from the day of the date hereof, And the said workmen do hereby severally promise and agree to and with the said John Smith that they will and well truly work for and abide with the said John Smith and no other person as his Hewers and Barrowmen at the said Colliery for the time aforesaid. And the Several Workmen agree that the said John Smith shall keep and detain out of our wages one shilling for every day which we or any of us disturbeth the work or refuseth to work or Insists on more wages than what is hereafter mentioned And also shall and will fill all the Corves of Coals so as the same shall come to bank more than wood full And for every corf of Coals that is not so he or they shall send up Another Corf of Coals in lieu thereof more than wood full. And for every Corf of Coals that are deemed foul to pay one penny And every person refusing to do so shall pay one Shilling which the said John Smith shall keep and detain in his hand out of the Wages of the person or persons so offending And for the true performance hereof on the part and behalf of the said Workmen they do hereby severally and respectively bind themselves separately unto the said John Smith In the sum of Ten pounds lawfull money. The Barrowmen does promise and agree with the said John Smith to run One Hundred yards to the West from every Shaft and Sixty yards to the East for Sixpence and one penny more to be paid them for every twenty yards they shall run further To run four Boards In every way In every Lift rank before they are to have any abatement or satisfaction made them by the said John Smith. And the said John Smith shall pay or cause to be paid once in every three weeks to the several workmen the rates or prices hereafter mentioned (that is to say) thirteen pence a score for every score of coals they shall severally and respectively Hew and work out of Charlaw and four pence a yard headways And threepence a yard for walls not less these two yards to lay upon Bank reckoning and allowing Eight pecks of Coals to each Corf the measure as is now used (viz) four pecks heaped and four stroked and twenty one Corfs to the score. In Witness whereof of the said Severall and Respective workmen have put their hands and seals the day and Year first above written.

¹ In the possession of Colonel Blackett.

Hewers.		Hewers each 10s. 6d. Barrowmen 5s. od.	
RALPH FERRY	O	RALPH ROBERT FAIRY	O
his		his	
ROBERT X STONES	O	THOS X HALL	O
mark		mark	
his		ROGER HOLIDAY	O
JOSEPH X HALL	O	WM X & JOS X HALL	O
mark		his	
GEORGE FERRY	O	JOSEPH X HALL	O
his		mark	
JOHN X HUNTER	O	JNO HUNTER	O
mark		JOSEPH X HOLIDAY	O
his		THOS X HALE	O
JOSEPH X HOLIDAY	O	ROGER HOLIDAY	O
mark		WM X HALE	O
	O	JOS. X HALE	O
	O	ROBT X STONES	O
		JOHN X POTTS	O
		WM X COBURN	O
Witnesses to the signing and Sealing			
ROBERT PROUD			
Witnesses to the signing and Sealing			
this 23 ^d Nov ^r 1767			
JOSEPH ERRINGTON			

ANDREWSHOUSE AND BYERMOOR BOND,¹ 1779

Articles of Agreement made the Twentieth Day of November One Thousand Seven Hundred and Seventy Nine Between Jewster Teasdale on behalf of Sir Thomas Clavering of Axwell Park in the County of Durham Baronet of the One Part, And us whose names are hereunto Subscribed and Seals affixed being Hewers of Coals and Drivers of Sled Horses on the other Part, *Witnesseth* that all and Singular us the said Hewers of Coals and Drivers of Sled Horses do Hire and detain ourselves and do hereby acknowledge ourselves Hired and detained by the Acceptance of One Pound Two Shillings Each Hewer of Coals, and Ten Shillings and Sixpence Each Driver of Sled Horses and other Considerations hereafter mentioned unto the said Sir Thomas Clavering from this Day unto the Twenty Second Day of November One Thousand Seven Hundred and Eighty to Hew Work and fill Coals and Drive Sled Horses in any Pit or Pits in Andrewshouse Colliery in the Chapelry of Tanfield in the County of Durham or in any Pit or Pits in Byermoor Colliery in the Parish of Whickham in the said County of Durham according to the Directions of the said Sir Thomas Clavering his Agent or Agents as he or they shall point out or direct from time to time *He* the said Sir Thomas Clavering paying or causing to be paid the Rates and Prices hereafter mentioned, to wit, unto the Hewers for every Score of Corves that shall be wrought in Andrewshouse Colliery the Sum of One Shilling and Eightpence for the whole Coal, Two Shillings for the whole under the Top, One Shilling and Eightpence & One Shilling and Sixpence for the Pillars, and Eight pence a Yard for Headways in whole Mine, and Six pence a Yard for the Pillars, each Corfts contain and hold Twenty four Pecks usual Coal measure, and

¹ In the possession of H. C. Embleton, Esq.

for every Score of Corves that shall be wrought in Byermoor Colliery aforesaid the Sum of One Shilling; and four pence a Yard Headways the Corf being kept up to the present Gauge now made use of, and to give such Consideration for hard and Troublesome Working over and above the Prices above mentioned as shall be though(t) reasonable by the said Sir Thomas Claverings Agents and the Drivers of Sled Horses do Agree to drive the said Horses along the Sledway with well loaden Corves and to drive such Quantities as the Overman shall direct for the Rates and Prices of One Shilling a Day unto the Twenty Second day of November next ensuing, And the Drivers to Assist the Hewers in filling the Coals as usual and all and Singular us the said Hewers and Drivers of Sled Horses do and each and every of us *Doth further* Covenant and Agree to begin our respective Work and during the whole Term to continue the same, And if any of us shall be absent from or neglect our said Work without sufficient reason for so doing *We* and each and every of us Agree to forfeit and pay One Shilling for every such Offence, if any of us the said Hewers do not keep our Coals clean from Stones or any other refuse or do not drive our Boards in a proper manner and according to the directions of the said Sir Thomas Claverings Agents or if any Corf be not Woodful when drawn to Bank then such Hower and Driver to whome it belongeth shall either send another Corf in its Room or for this and the former Offence shall forfeit One Shilling each and all such forfeiture shall be payable at the first pay which shall happen after such Offence or Offences are committed. *In Witne/s* whereof we the said Parties have hereunto set our Hands and Seals the day and Year first above written.

his JOSEPH X SOULSBY O	his ROBERT X CHAPMAN O	his JOHN X STOBS O
Mark THOMAS CHAPMAN O	Mark THOMAS X RAMSHAY O	his ROBERT X STOBS O
JOHN STOBBS O	his ROBT JOHNSON O	his WILLIAM X WILSON O
	his JAMES X CLARK O	his THOMAS X WALKER O
	Mark MICHAEL X RAMSHAY O	his JOHN X MURTON O
	his JOHN X RAMSHAY O	his THOMAS X MURTON O
	Mark JOHN X SOULSBY O	his JOHN X THOMPSON O
	his GEORGE X HARDING O	his ROBERT X HARDING O
	Mark	Mark

APPENDIX C

A NOTE ON PROFITS

INDUSTRIALISTS and their friends are notoriously inclined to understate the rewards that come to them. "One coal-merchant employeth five hundred or a thousand in his works of coale", wrote Grey in 1649, "yet for all his labour, care, and cost, can scarce live of his trade". A hundred and eighty years later John Buddle,¹ speaking of the profits of the preceding decades in the Great Northern Coalfield, declared that "by no means 10 per cent has been made at simple interest, without allowing any extra interest for the redemption of capital". And a later writer² refers to "the generally inadequate return for the large capital invested" in the north of England.

There is reason to believe, however, that the results of mining were by no means so unsatisfactory to the investor as these authorities imply. After 1771, when a "regulated trade" was introduced, the profit on Washington Colliery "was better than 15 per cent upon the capital of £15,000 expended on that colliery", though the word "capital" was used to mean expenditure on the opening and equipping of the colliery and did not cover the expenses of working.³ Fifteen per cent on fixed capital seems, indeed, to have been the usual basis adopted by colliery viewers in determining the selling value of established concerns. This was so, for example, in 1806, when proposals were made for the sale of Tyne Main Colliery, and three years later virtually the same rate was allowed to Simon Temple who was purchasing the holding of his partner, William King, in King's Colliery; the valuation was £128,695 and the estimated annual profits for a future of thirty-five years were £18,750.⁴

This rate took account of the risks normally attendant on the running of a colliery, such as those from water, seepage, and the exhaustion of the mineral, for none of these was insurable.⁵ But the greater uncertainties associated with boring, sinking, and the opening up of the workings had already been met, market connections had been established, stable prices had been secured under the vend, and the capacity of the colliery to earn profits had been proved. In other cases where all these hazards had to be borne a higher rate of return may reasonably have been anticipated. When, in 1816, three-twentieths of the stock of Coxlodge and Kenton Collieries changed hands, the average return on the capital originally invested was said to have been 27 per cent.⁶ At Manor Wallsend Colliery, the valuation of which in 1811 was £44,215, the working costs for the years 1820-27 were £214,102, and the net profits were £18,266. And at Dorothea Colliery in 1821 the working expenses were £29,263, and the profits £23,913, equal to 18 per cent of the

¹ *Report* (1829), *Evidence*, 57.

² Dunn, *op. cit.* 3.

³ *Report* (1800), App. 542, ev. Francis Thompson.

⁴ *Watson Coll.* 3059, 3065.

⁵ *Hist. Rev. of Coal Mining*, 303. As late as 1836 John Buddle told the Select Committee that his mining property could not be insured, for "no one would take such risks". *Report* (1836), Q. 736.

⁶ *Watson Coll.* 3023.

estimated value of the colliery. As in all cases where wasting assets are involved these rates of profits must be taken to include an instalment of capital repaid to the investor. The profits at Gateshead Colliery in 1819 were £7000 on an expenditure of £15,320 in opening up the colliery, but this rate of 46 per cent could not continue, it was estimated, for more than $4\frac{1}{4}$ years, when the coal would all have been got.¹

An examination of returns of collieries over a series of years shows occasional losses. At Middleton Colliery between 1800 and 1808 inclusive there were eight years of profit and one of loss, and at Manor Wallsend between 1820 and 1827 profits were made in six years and losses in two.² A smaller concern of an earlier period shows, however, a long series of years in which the working costs exceeded the takings. The gains and losses on John Barnes' enterprise at Barlow from its beginning to the death of its proprietor in 1776 were as follows:³

Gain (+) or Loss (-).				Gain (+) or Loss (-).			
1763-64 ($1\frac{1}{4}$ years)	.	-£2	7 10	1771 . . .	+	£98	10 1
1765 . . . .	.	+71	7 2	1772 . . .	-	16	0 $1\frac{1}{2}$
1766 . . . .	.	+22	15 $9\frac{1}{2}$	1773 . . .	-	45	1 10
1767 . . . .	.	+24	19 $2\frac{1}{2}$	1774 . . .	-	91	9 $7\frac{1}{2}$
1768 . . . .	.	+13	1 $1\frac{1}{2}$	1775 . . .	-	54	5 3
1769 . . . .	.	-15	6 $10\frac{1}{2}$	1776 (6 mos.)	-	137	17 $10\frac{1}{2}$
1770 . . . .	.	+24	8 $9\frac{1}{2}$				

Such runs of ill-fortune were probably not uncommon. But the fortunes accumulated by families like the Brandlings, the Tempests, the Newdigates, the Bradshaighs, the Mackworths, the Lowthers, and the Curwens suggest that the compensation for risk-bearing was by no means small. And the frequency with which leases were renewed by the original lessees, when they fell in, implies that the entrepreneurs were not dissatisfied with the share of the earnings of the industry that came to them.

¹ *Watson Coll.* 3023.

² *Ibid.*

³ *Barlow MSS.* See G. W. Daniels and T. S. Ashton, "The Records of a Derbyshire Colliery", *Econ. Hist. Rev.* vol. ii. No. 1, 124.

APPENDIX D

THE DUTIES ON SEA-BORNE COAL

DURING the eighteenth century the trade in coal was burdened by both export and import duties. The chief of the export duties, known as the "Richmond Shilling", was peculiar to the port of Newcastle. It originated in 1600 in a demand made by Elizabeth for the arrears of a duty of 2d. a chaldron levied as a perpetual charge in 1421. Since these could not be paid, the Hostmen agreed to the imposition of a duty of 1s. a chaldron on all future shipments. In 1677 the reversion of this tax was granted by Charles II. to the Duke of Richmond, whose descendants had the benefit of it until 1799, when the Government paid £400,000 for the title to the proceeds. The transaction brought no relief to Newcastle, for the duty was continued, and in 1803 was increased by a special war impost of 4d. a chaldron.

Town dues were also levied at the exporting centres: Newcastle took 2d. a chaldron throughout the period; Sunderland took 2d. till 1747, then 4d. till 1785, and after that 6d.

Heavy export duties were imposed on shipments to foreign countries. From 1714 (by 12 Anne, c. 9) the impost was 3s. a chaldron on coals exported in British vessels, and 5s. on those exported in foreign vessels. Successive increases (by 30 Geo. II. c. 19, 1 Geo. III. c. 7, 5 Geo. III. c. 35, and 35 Geo. III. c. 20) brought the total to no less than £1 a chaldron in 1795; and additions made during the great war in 1803 and 1809 carried it to the maximum of £1 : 5 : 2. The war levies were removed in 1815, and some relief was given by the Small Coal Act of 1824; but foreign exports did not share in the repeal of 1831, and the duties were retained (with small reductions in 1831 and 1834) until 1845.

The first heavy duty on imports of coal was a charge of 2s. a chaldron levied in 1670 (by 11 Car. II. c. 3), the proceeds of which were to go to the rebuilding of the London churches which had been destroyed by the Great Fire.¹ It was increased (by 9 Anne, c. 22) in order that a further 50 churches might be built, and it was afterwards made perpetual (by 6 Geo. I. c. 4) and assigned to the City of London. Actually only 10 or 12 churches were built out of the funds raised from it after 1710, and in 1722 (by 1 Geo. II. c. 8) it was converted into a State annuity.

Another duty levied for a special purpose was the outcome of an "Act for the relief of the Orphans and Other Creditors of the City of London" (5 & 6 William and Mary, c. 10), which provided that 4d. should be added to the existing charge for metage. With later additions the tax was continued to 1827 and was the chief reason for the great expense of measuring coal at London compared with that at the outports.

More important were the duties levied for "extraordinary purposes". In 1695 a war tax of 5s. a chaldron was imposed on water-borne coal, and this, with a later addition, persisted to 1710. In 1710 other duties amounting to 2s. a chaldron were raised and these were made perpetual by 5 Geo. I. c. 19.

¹ In 1677 a further tax of 3s. was imposed, largely to cover the cost of rebuilding St. Paul's.

It was not until 1779 that the next increase took place, when (by 19 Geo. III. c. 25) a general surtax of 5 per cent on all existing duties was imposed; in 1782 a further increase of a like amount was made; and in 1787 (by 27 Geo. III. c. 13) the whole of the duties were lumped into a Consolidated Charge. The effect of this was to make the local taxes on imported coal amount to 8s. 10d. per London chaldron at the metropolis, and 5s. 6d. at other ports.

The expenditure during the Napoleonic Wars led to another increase of 5 per cent in 1797, and yet another in 1803; while a final war-impost of 12½ per cent in 1809 brought the import duties to their highest point of 12s. 6d. a chaldron. The last addition was dropped in 1815; in 1824 the duties were lessened by 3s. 4d.; and all duties were abolished (by 1 & 2 William IV. c. 6) in 1831.

Needless to say, such impositions gave rise to many protests. There was, of course, the stock objection to any tax on sea-borne coal that it injured the "Universal Nursery of our Ships and Sailors".¹ But complaint was also made of the inequitable distribution over the different parts of the country. Land-sale coal was free of tax, and so the regions about the coalfields were given advantages over and above those conferred upon them by nature. London was specially burdened, for the duties there were higher than at most other ports. After 1711 they were never less than 8s. a (London) chaldron; and on the basis of the lowest price recorded during the whole period (21s. a chaldron in 1728)² they caused an increase of price to the consumer of at least 37 per cent. For the period as a whole the addition can rarely have been below 33½ per cent.

The City, it is true, obtained some benefits from the proceeds, but the effects of the duties were felt over wide areas which had no share in the revenue. "London consumes not the eighth part of the Coals that pay to the tax", declared an early writer;³ and since the cost of carriage on the Thames was heavy (10s. to 20s. in 1729), the home counties had to pay very dearly for their fuel, and it was "really surprising how several Trades can subsist elsewhere than at Newcastle, Sunderland, or some Place thereabouts".⁴ In 1741 relief was given to the mines of Devon and Cornwall; in 1763 the ports north of the Firth of Forth were given exemption; and at no time were the export or import duties on coal entering Ireland of any great moment. But throughout the whole period the consumers and industrialists of the south-west of England were seriously burdened.

If the principal count in the indictment of the system was that "it is inimical to population and harasses the poor",⁵ a subordinate objection lay in the effect on the producers. The incidence of a tax per unit of output on a monopoly such as that possessed by the northern coal-owners would tend to be borne by the consumers, but the tax would cause a contraction of demand and give the producers a smaller revenue than they would otherwise have obtained. The effect was specially harmful to the collieries which produced a high proportion of small coals. For though the duties discriminated between coal and culm, those coals that had passed through a half-inch, but not through a three-eighths inch, screen were not entitled to a reduction of duty. The demand for coal of this size was not so intense as to bear a high tax, and much of the coal was therefore wasted.

¹ *The Mischief of the Five Shillings Tax on Coal* (1699), 4; Macnab, *Third Letter to William Pitt* (1793), 104 *et seq.*

² *J.H.C.* xxi. 370.

³ *Reasons for not laying Additional Taxes* (Broadsheet, Guildhall Library).

⁴ *Enquiry into the Reasons, etc.* (1739), 36.

⁵ Edington, *Treatise* (1813), 237.

APPENDIX E

STATISTICS OF EXPORTS FROM THE TYNE AND THE WEAR AND OF IMPORTS INTO LONDON

THE following statistics are drawn mainly from the *Bell Collection*, Neville Hall, Newcastle-on-Tyne, and *Surtees Society Transactions*, cv. Other sources are: Scott, *Epitome of the Progress of the Trade in Coal to London* (1869); Dunn, *A View of the Coal Trade* (1844); Meade, *Coal and Iron Industries of the United Kingdom*; Hutchinson, *History of Cumberland*; Bailey and Culley, *A General View of the Agriculture of Northumberland*; Holmes, *Treatise on the Coal Mines of Durham and Northumberland*; the 1800, 1829, and 1830 Committees on the Coal Trade; the *Report of the Coal Commission*, iii., 1871; Galloway, *Annals of Coal Mining*; Taylor, *Archaeology of the Coal Trade*; and *A Statement of the Quantity of Coal Imported into London* (1819), Anon.

Year.	Exports from the Tyne. (ooo's omitted.)	Exports from the Wear. (ooo's omitted.)	Imports into London. (ooo's omitted.)
	Newcastle Chaldrons.		London Chaldrons.
1700 . . .	205	...	335
1701 . . .	245	...	400
1702 . . .	153	...	243
1703 . . .	170	...	301
1704 . . .	198	...	...
1705 . . .	182	...	...
1706 . . .	163	...	...
1707 . . .	151	...	...
1708 . . .	193	...	361
1709 . . .	211	...	...
1710 . . .	168	66	328
1713 . . .	...	...	346
1714 . . .	...	...	414
1715 . . .	...	...	388
1716 . . .	...	...	412
1717 . . .	...	...	440
1718 . . .	...	...	412
1719 . . .	...	...	420
1720 . . .	...	...	425
1721 . . .	...	...	459
1722 . . .	...	...	460
1723 . . .	262	...	458
1724 . . .	253	...	451
1725 . . .	266	...	471
1726 . . .	286	...	508

Year.	Exports from the Tyne. (ooo's omitted.)	Exports from the Wear. (ooo's omitted.)	Imports into London. (ooo's omitted.)
	Newcastle Chaldrons.		London Chaldrons.
1727 . . .	277	...	496
1728 . . .	247	...	453
1729 . . .	293	...	494
1730 . . .	277	...	455
1731 . . .	311	...	475
1732 . . .	269	...	451
1733 . . .	291	...	496
1734 . . .	274	...	448
1735 . . .	282	...	503
1736 . . .	297	...	512
1737 . . .	276	...	476
1738 . . .	271	...	491
1739 . . .	288	...	442
1740 . . .	320	...	563
1741 . . .	263	...	453
1742 . . .	270	...	457
1743 . . .	298	...	478
1744 . . .	273	...	468
1745 . . .	295	...	471
1746 . . .	303	...	487
1747 . . .	259	...	469
1748 . . .	271	147	450
1749 . . .	299	135	504
1750 . . .	288	162	458
1751 . . .	343	129	539
1752 . . .	308	177	508
1753 . . .	301	167	508
1754 . . .	305	166	527
1755 . . .	294	174	479
1756 . . .	311	175	550
1757 . . .	274	179	503
1758 . . .	240	187	452
1759 . . .	302	187	552
1760 . . .	285	180	499
1761 . . .	328	170	505
1762 . . .	294	172	530
1763 . . .	293	182	603
1764 . . .	349	205	597
1765 . . .	349	204	588
1766 . . .	353	206	639
1767 . . .	359	196	599
1768 . . .	...	203	614
1769 . . .	...	215	642
1770 . . .	372	213	613
1771 . . .	...	220	678
1772 . . .	352	257	711

Year.	Exports from the Tyne. (ooo's omitted).	Exports from the Wear. (ooo's omitted).	Imports into London.
	Newcastle Chaldrons.		London Chaldrons.
1773 . . .	...	241	645
1774 . . .	...	245	615
1775 . . .	...	244	664
1776 . . .	380 ¹	262	690
1777 . . .	...	253	685
1778 . . .	366	233	640
1779 . . .	...	215	589
1780 . . .	366	225	657
1781 . . .	335	210	651
1782 . . .	364	212	661
1783 . . .	413	238	695
1784 . . .	458	244	725
1785 . . .	450	266	733
1786 . . .	434	259	730
1787 . . .	480	275	653
1788 . . .	...	279	771
1789 . . .	487	295	811
1790 . . .	408	283	753
1791 . . .	445	292	822
1792 . . .	479	314	850
1793 . . .	473	298	801
1794 . . .	402	279	783
1795 . . .	488	289	910
1796 . . .	459	253	783
1797 . . .	469	274	890
1798 . . .	412	269	775
1799 . . .	457	288	880
1800 . . .	618	322	1010

¹ Average 1770-1776.

The Newcastle chaldron weighed 53 cwts. ; the London chaldron about 28½ cwts. Eight Newcastle chaldrons were equivalent to fifteen London chaldrons.

APPENDIX F

PRICES RECORDED AT LONDON AND THE NORTHERN PORTS

THE sources of the prices both at London and in the North are again mainly to be found in the extensive *Bell Collection* at Newcastle. In addition, prices were frequently quoted in the evidence to the House of Lords and House of Commons Committees of 1690-1691, 1703, 1729, 1730, 1800, 1829, 1830, 1836, and the Coal Commission of 1871. There is much information, too, in the various Acts regulating prices. Information has also been obtained from *Surtees Society Transactions*, vol. cv.; Philaethes, *Enquiry into the Extravagant Price of Coals* (1729); Anon., *Enquiry into the Reasons of the Advance in the Price of Coals within this last Seven Years Past*, 1739; Anon., *Mischief of the Five Shillings Tax on Coal*, 1699; Brand, *History of Newcastle*, vol. 11; Stephenson, *Observations on the Coal Trade*, 1789; the various volumes of the *Historical Manuscripts Commission* already cited; the *Letter* (1803), the *Treatise* (1813), and the *Treatise on the Abuses of the Coal Trade* (1817) of Edington; Macnab's *Letters to Wm. Pitt*, 1793; Dunn, *A View of the Coal Trade*; Galloway, *Annals of Coal Mining*; *Letter to R. W. Brandling*, by a Ship-Owner (1829); *Exposition of the Real State of the Coal Trade* (1830); Archer, *History of the Coal Trade of Northumberland and Durham*; *Annual Register* (*passim*); *Gentleman's Magazine* (*passim*); Mulhall, *Dictionary of Statistics*; and Macpherson's *Commercial Dictionary*.

Year.	Price in the North of a Newcastle Chaldron.	Price at London of a London Chaldron.	Remarks.
1665	13/-	30/-	{ Newcastle price is for London chaldron.
1674	7/-	20/-	
1699	10/-	42-44/-	
1703	11/6	over 40/-	
1729	12/-	32/-	{ 70/- recorded during frost.
1731	9/6	23/6	
1739	13/-	28/-	
1740	about 13/-	36/-	
1744	11/-	about 29/-	{ Newcastle figure is for Friar's Goose—a good quality coal.
1750	11/6	about 29/-	
1761	15/-	36/-	{ Newcastle figure is for Long Benton.
1763	...	55/-	
1771	12-15/-	41-47/-	{ This seems to have been a minimum figure.
1772	...	31/-; 41/-; 84/-	
			All three prices recorded.

Year.	Price in the North of a Newcastle Chaldron.	Price at London of a London Chaldron.	Remarks.
1773	...	36/-	Surtax of 5% added.
1774	...	39/-	
1775	...	41/-	
1776	...	42/-	
1778	...	40/-	
1779	...	42/-	
1780	...	44/-	
1781	20/6	44/-	
1785	...	31/-	
1786	17/-	37/-	
1787	17/-; 18/6	32/-; 36/-	Two prices recorded.
1788	...	30/-	{ Both prices recorded at New-castle.
1789	17/-; 18/6	30/-	
1790	...	32/9	Both prices recorded.
1791	...	31/6; 35/6	
1792	...	30/9	Duties increased 5%.
1793	18/-	35/-	
1794	19/-	44/-	
1795	...	50/-	
1796	...	45/8	
1797	...	43/-	{ £6 also quoted on account of temporary scarcity.
1798	...	44/6	
1799	...	57/-; 73/6	
1800	26/6	60-70/-	

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